NONPOINT SOURCE SCREENING ASSESSMENT OF SOUTHEAST ALABAMA RIVER BASINS – 1999

CHOCTAWHATCHEE RIVER BASIN

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AQUATIC ASSESSMENT UNIT ✦ FIELD OPERATIONS DIVISION
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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EXECUTIVE SUMMARY

***Background*:** In 1996, the Alabama Department of Environmental Management (ADEM) adopted a basinwide approach to nonpoint source monitoring and management using a repeating 5-year management cycle. Because of the 5-year rotation, basins are placed into groups so that all basins receive equal focus. Concentrating planning and implementation efforts within one basin group allows a focused review of available data and provides coordinated water quality monitoring and assessment efforts, efficient implementation of control activities on a geographic basis, and consistent and integrated decision-making for awarding CWA §319 funds.

During 1999, the Aquatic Assessment Unit (AAU) of the Field Operations Division completed basinwide screening assessments of the Southeast Alabama River basins. This document provides an overview of the basinwide screening assessment conducted in the Chocatwhatchee River basin. Land use information and assessment data available from each of the 41 sub-watersheds in the Choctawhatchee basin is summarized.

Land use: Land use percentages (Table E-1) and estimates of animal populations and sedimentation rates were obtained from information provided to ADEM by the Alabama Soil and Water Conservation Committee (ASWCC) and local Soil and Water Conservation Districts (SWCD). This information was provided on Conservation Assessment Worksheets completed in 1998 (FY97 CWA §319 Workplan Project #4) and entered into an ACCESS database by ADEM.

Table E-1. Estimates of percent land cover within the Upper Choctawhatchee, Pea River, and Lower Choctawhatchee River CUs (ASWCC and SWCD 1998).

Cataloging Unit	Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
Upper Choctawhatchee	47%	29	14%	0%	5%	1%	3%
Pea River	62%	21%	12%	0%	2%	1%	1%
Lower Choctawhatchee	34%	45%	15%	0%	1%	0%	5%

Nonpoint Source (NPS) impairment potential: The potential for NPS impairment was estimated for each sub-watershed in the Choctawhatchee River basin using data compiled by the local SWCD (1998) (Tables E-2a and E-2b) and information on the number of current construction stormwater authorizations. Thirty-six of the 41 sub-watersheds were estimated to have a *moderate* or *high* potential for impairment from nonpoint sources. The NPS concerns within each Cataloging Unit (CU) were generally similar, with runoff from animal production operations, aquaculture operations, cropland, and pasture estimated as the main concerns.

Table E-2a. Number of sub-watersheds with moderate or high ratings for each NPS category

Cataloging Unit	Total # sub-watersheds	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Upper Choctawhatchee	25	22	18	15	9	19	1	5	12
Pea River	13	11	11	7	11	10	5	8	10
Lower Choctawhatchee	3	3	3	3	3	3	0	2	3

Table E-2b. Number of sub-watersheds with moderate or high ratings for each point source or urban category

Category	% Urban	Development	Septic tank failure
Upper Choctawhatchee	11	10	0
Pea River	2	10	0
Lower Chattahoochee	0	1	0

***Historical data/studies*:** The majority of assessments used to evaluate the status of impairment within the Choctawhatchee basin were conducted during the NPS Screening Assessment of the Southeast Alabama Basins and 3 additional projects (Table E-3) conducted by ADEM. Data collected by Troy State University (Appendix F-4), Auburn University (AUCE 1999) and historical ADEM data is also provided.

These data include both monitored and evaluated assessments. Monitored assessments are based on chemical, physical, and/or biological data collected using commonly accepted and well-documented methods. Evaluated assessments are based on observed conditions, limited water quality data, water quality data older than 5 years, or estimated impacts from observed or suspected activities.

Results of monitored assessments were used in this report to assess habitat, biological, and chemical conditions within a sub-watershed. Monitored assessments were conducted during the NPS Screening Assessment and 3 additional projects (Table E-3). Evaluated assessments were conducted in conjunction with ADEM's ALAMAP Program (Appendix F-8and F-9) and Clean Water Strategy Project (Appendix F-10). A summary of each project, including lead agency, project objectives, data collected, and applicable quality assurance manuals, is provided in the appendices.

Table E-3. Projects that have generated monitored assessment information.

Project	Appendix
ADEM's Ecoregional Reference Site Program	F-1, F-2
ADEM's §303(d) Waterbody Monitoring Program	F-5
Southeast Alabama Poultry Industry Impact Study	F-6

Assessments conducted: Sub-watersheds were selected for assessment if recent monitoring data were not available, potential impacts from point sources or urban areas were minimal, and the sub-watershed was ranked as a priority by the local SWCD. In addition, sampling was coordinated among projects, such as ALAMAP, §303d Monitoring, and the Southeast Alabama Poultry Industry Impact Study to maximize the number of streams assessed and to prevent duplication of effort. Assessments were conducted in 18 sub-watersheds in the Choctawhatchee basin.

***Subwatershed summaries*:** Current and historical monitoring data were combined to provide a comprehensive assessment. A summary of information available for each of the 41 sub-watersheds is provided. The summaries are organized into 3 sections by CU. Each summary discusses land use, NPS impairment potential, assessments conducted within the sub-watershed, and the NPS priority rating based on available data. The summaries point out significant data and reference appropriate tables and appendices. Assessment of habitat, biological and chemical conditions are based on long-term data from ADEM's Ecoregional Reference Site Program.

Tables referenced in the summaries are located at the end of each summary section. Appendices are located at the end of the report.

Subwatershed assessments: Habitat, chemical/physical, and biological indicators of water quality were monitored at 36 stations within 18 sub-watersheds. These data are summarized in Table 16. Aquatic macroinvertebrate assessments were conducted at each of the 36 stations. Fish Community Index of Biotic Integrity (IBI) assessments were conducted at 15 of these stations. Overall condition for each station was rated as the lowest biological assessment result obtained. Sixteen of the 24 stations were assessed as *fair* or *poor*.

***Priority sub-watersheds*:** Fourteen priority sub-watersheds were identified within the Choctawhatchee River Basin (Table E-4).

Table E-4. Sub-watersheds recommended for NPS priority status.

Subwatershed Number	Subwatershed Name	Lowest Station Assessment	Suspected Cause(s)	Suspected nonpoint source(s)
0201-020	Lower E. Fork Choctawhatchee	Very Poor	Nutrients, Organic Enrichment	Animal production operations, sedimentation
0201-070	Lower W. Fork Choctawhatchee	Fair	Unknown	Animal production operations, mining
0201-080	Upper Judy Creek	Poor	Nutrients, Organic Enrichment	Animal production operations, mining
0201-100	Lower Judy Creek	Poor	Nutrients, Organic Enrichment	Animal production operations
0201-130**	Little Choctawhatchee River	Poor	Nutrients, Organic Enrichment	Unknown NPS, point source
0201-170**	Harrand Creek	Poor	Nutrients, Organic Enrichment	Unknown NPS, point source
0201-220	Choctawhatchee River	Fair	Unknown	Row crops
0202-010	Pea River	Poor	Unknown	Unknown
0202-030	Buckhorn Creek	Fair	Organic enrichment	Aquaculture operations
0202-040	Pea River	Fair	Nutrients, Organic Enrichment	Unknown
0202-070	Whitewater Creek	Fair	Nutrients, Organic Enrichment	Mining
0202-080**	Big Creek	Fair	Organic enrichment	Mining
0202-100	Pea River	Poor	Unknown	Animal production operations, sedimentation
0203-130	Holmes Creek	Fair	Unknown	Aquaculture, Row Crops

** These sub-watersheds were sampled in-conjunction with ADEM's 303(d) stream monitoring in 1999, therefore the impairment may result from point sources and nonpoint sources.

Lower East Fork Choctawhatchee (0314-0201-020): Five stream segments were assessed in 1999. Four of these stream segments had *poor* to *fair* macroinvertebrate and fish communities. Animal concentrations and sedimentation rates were estimated as *moderate* within the sub-watershed. Biochemical oxygen demand (BOD5) was slightly above normal levels at two stream locations and dissolved oxygen was low at one station during the fish community survey.

Lower West Fork Choctawhatchee (0314-0201-070): Macroinvertebrate and fish assessments conducted at 2 stations indicated the communities to be in *fair* condition. Animal concentrations were estimated as *high* and the potential for NPS impairment from mining was estimated to be *high*.

***Upper Judy Creek (0314-0201-080)*:** Two stations were sampled within this sub-watershed during the 1999 projects. Both locations indicated impaired biological conditions. Animal concentrations were estimated as *high* and the potential for NPS impairment from mining was estimated to be *high*.

Lower Judy Creek (0314-0201-100): One stream segment was sampled within this sub-watershed during the Southeastern Poultry Industry Impact Study. This stream reach was monitored 9 different times over a 13 month period to collect a baseline of water quality data. The macroinvertebrate community was sampled in 1998 and 1999 and the fish community was sampled in 1999. Both communities indicated impaired biological conditions.

***Little Choctawhatchee River (0314-0201-130)*:** Habitat and macroinvertebrate assessments were conducted at one location on Beaver Creek (BVC-2) while conducting 303(d) stream monitoring associated with the Beaver Creek WWTP. The stream reach at BVC-2 indicated the macroinvertebrate community to be in *poor* condition. Intensive chemical sampling of 3 locations on Beaver Creek showed fecal coliform, NO_3+NO_2, and BOD concentrations to be periodically high and a potential source of biological impairment.

***Harrand Creek (0314-0201-170)*:** Habitat and macroinvertebrate assessments were conducted at two stream segments of Harrand Creek and one tributary of Harrand Creek while conducting 303(d) stream monitoring associated with the Harrand Creek WWTP. All three segments indicated impaired biological communities. Intensive chemical sampling showed fecal coliform, NO_3+NO_2, and BOD concentrations to be periodically high and a potential source of biological impairment.

***Choctawhatchee River (0314-0201-220)*:** This sub-watershed had two streams monitored during the NPS Screening Assessment. The stream reach sampled on Adams Creek (ASCG-1) indicated *moderate* impairment of the biological conditions. The potential of NPS impairment from cropland was estimated as *high.*

***Pea River (0314-0202-010)*:** Three stations were sampled in this sub-watershed while conducting the NPS Screening Assessment. All three locations indicated impaired biological conditions. The stream reach sampled on Dry Creek (DRYB-1) indicated severe impairment of both the macroinvertebrate and fish communities. At this time there is no indication of the cause of impairment.

***Buckhorn Creek (0314-0202-030)*:** One stream segment was sampled within this sub-watershed during the Southeastern Poultry Industry Impact Study. This stream reach was monitored 9 different times over a 13 month period to collect a baseline of water quality data. The macroinvertebrate community was sampled in 1998 and 1999. The macroinvertebrate community in 1998 was assessed as *good*, but in 1999 the community indicated *moderate* impairment. Intensive chemical sampling showed fecal coliform and BOD concentrations to be periodically high and a potential source of biological impairment.

***Pea River (0314-0202-040)*:** One stream segment was sampled within this sub-watershed during the Southeastern Poultry Industry Impact Study. This stream reach was monitored 9 different times over a 13 month period to collect a baseline of water quality data. The macroinvertebrate community was sampled in 1998. The macroinvertebrate community was assessed as *fair* indicating *moderate* impairment. Intensive chemical sampling showed fecal coliform, NO_3+NO_2, and BOD concentrations to be periodically high and a potential source of biological impairment.

***Whitewater Creek (0314-0202-070)*:** Four stream segments were monitored within the sub-watershed in 1999. Two segments were sampled as part of the NPS screening assessment and two segments were sampled during the Southeastern Poultry Industry Impact Study. One of the poultry impact study stations indicated moderate impairment of the fish community. As with the other poultry impact study monitored streams, the stream reach at WWCC-2 was monitored 9 different times over a 13 month period to collect a baseline of water quality data. The potential of NPS impairment from mining was estimated as *high*, and intensive chemical sampling showed NO_3+NO_2, and BOD concentrations to be periodically high and a potential source of biological impairment.

***Big Creek (0314-0202-080)*:** Habitat and macroinvertebrate assessments were conducted at one stream segment of Cowpen Creek while conducting 303(d) stream monitoring in 1999. The macroinvertebrate community was assessed as *fair* indicating moderate impairment of biological conditions. All three segments indicated impaired biological communities. Intensive chemical sampling showed fecal coliform and BOD concentrations to be periodically high and a potential source of biological impairment.

***Pea River (0314-0202-100)*:** Patrick Creek (PATC-1) is an ecoregional reference site and was sampled in-conjunction with the NPS Screening Assessment. The stream reach was assessed with a *fair* macroinvertebrate community and *poor* fish community indicating impaired biological conditions. The potential for NPS imapirment from animal concentrations and sedimentation were estimated as *moderate* and are potential sources of impairment.

***Holmes Creek (0314-0203-130)*:** This sub-watershed had one stream monitored during the NPS Screening Assessment. The stream reach sampled on Holmes Creek (HSCG-1) indicated moderate impairment of the fish community. The potential for NPS impairment from aquaculture and row crop runoff was estimated as *high.* These are potential sources of the moderate impaired biological conditions.

Figure 1. NPS Priority Sub-Watersheds of the Choctawhatchee (0314-0201) and Pea (0314-0202) River Cataloging Units of Southeast Alabama.

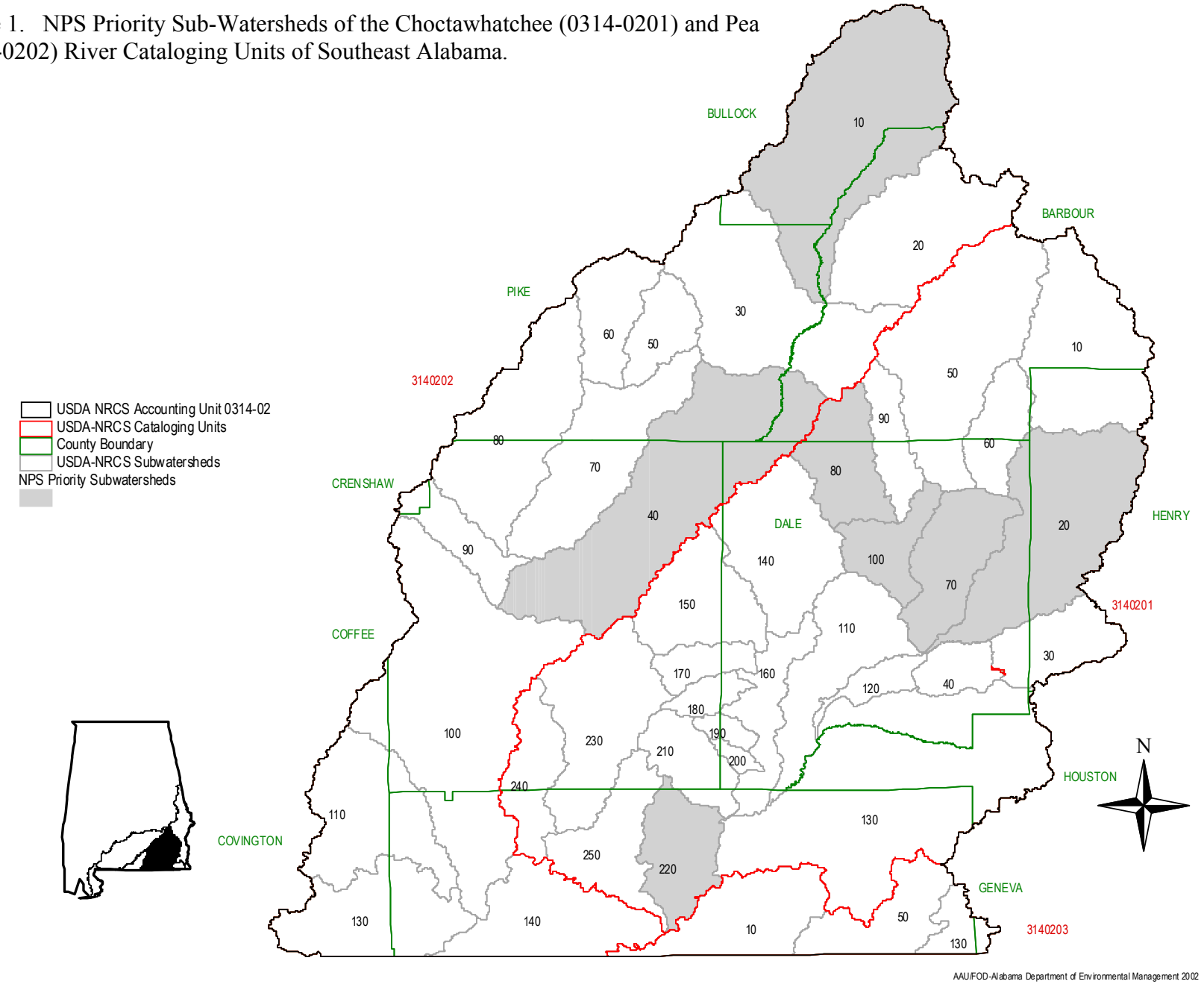


Figure 2a. Estimates of NPS Impairment Potential for Sub-Watersheds of the Choctawhatchee (0314-0201) and Pea (0314-0202) River Cataloging Units.

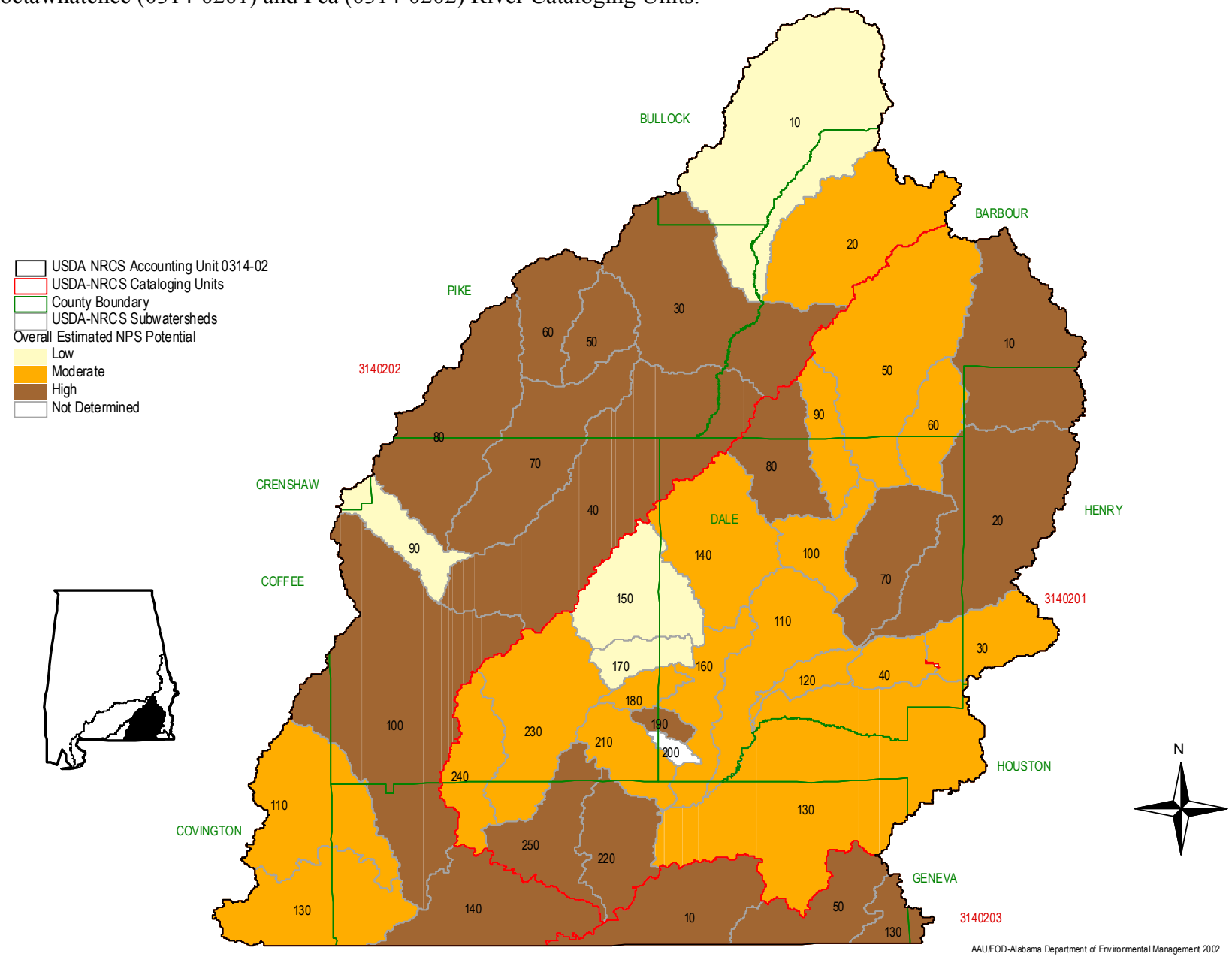


Figure 2b. Estimates of NPS Impairment Potential from Animal Husbandry Activities Based Upon Local SWCD Animal Population Estimates for the Choctawhatchee (0314-0201) and Pea (0314-0202) River Cataloging Units.

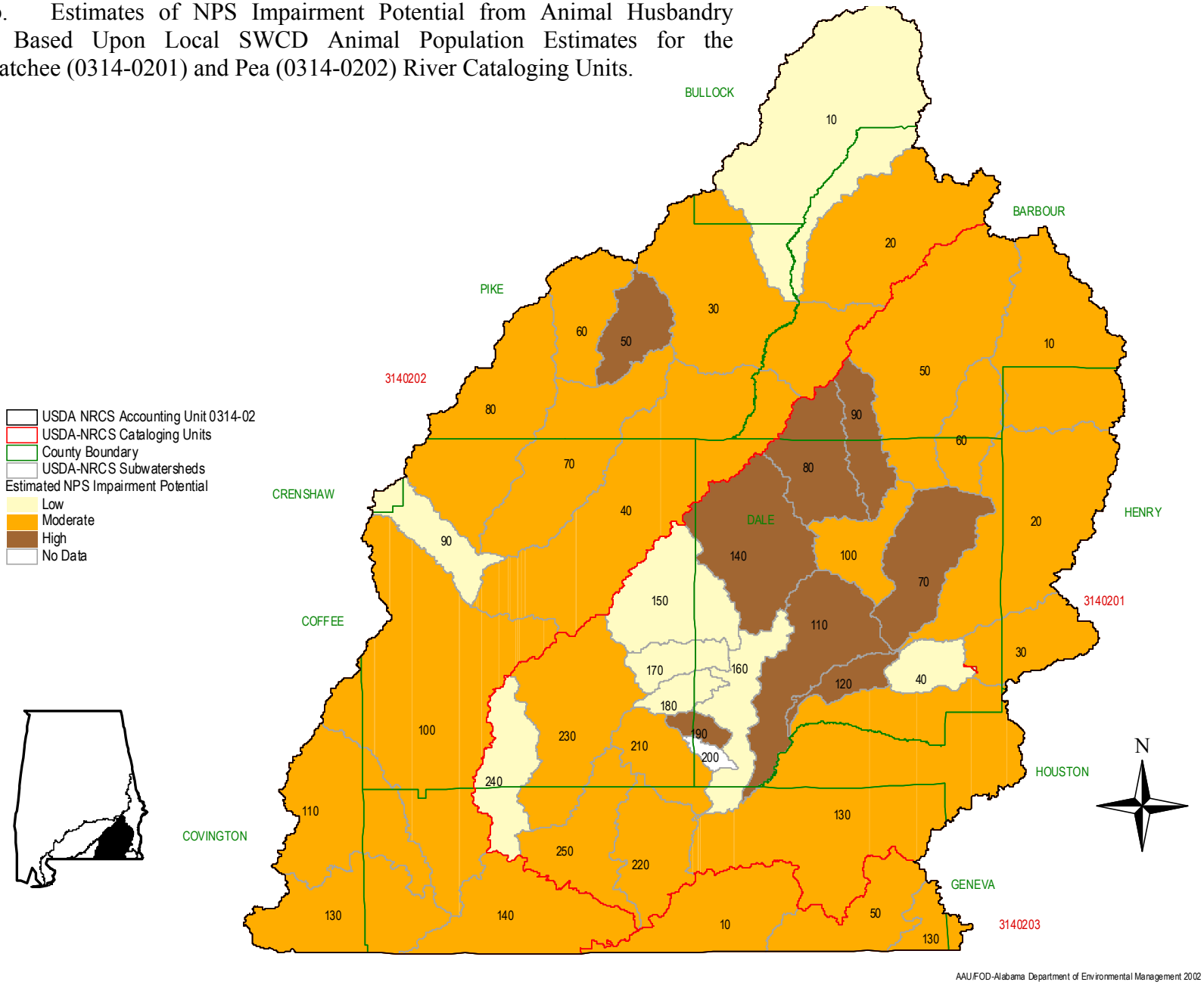
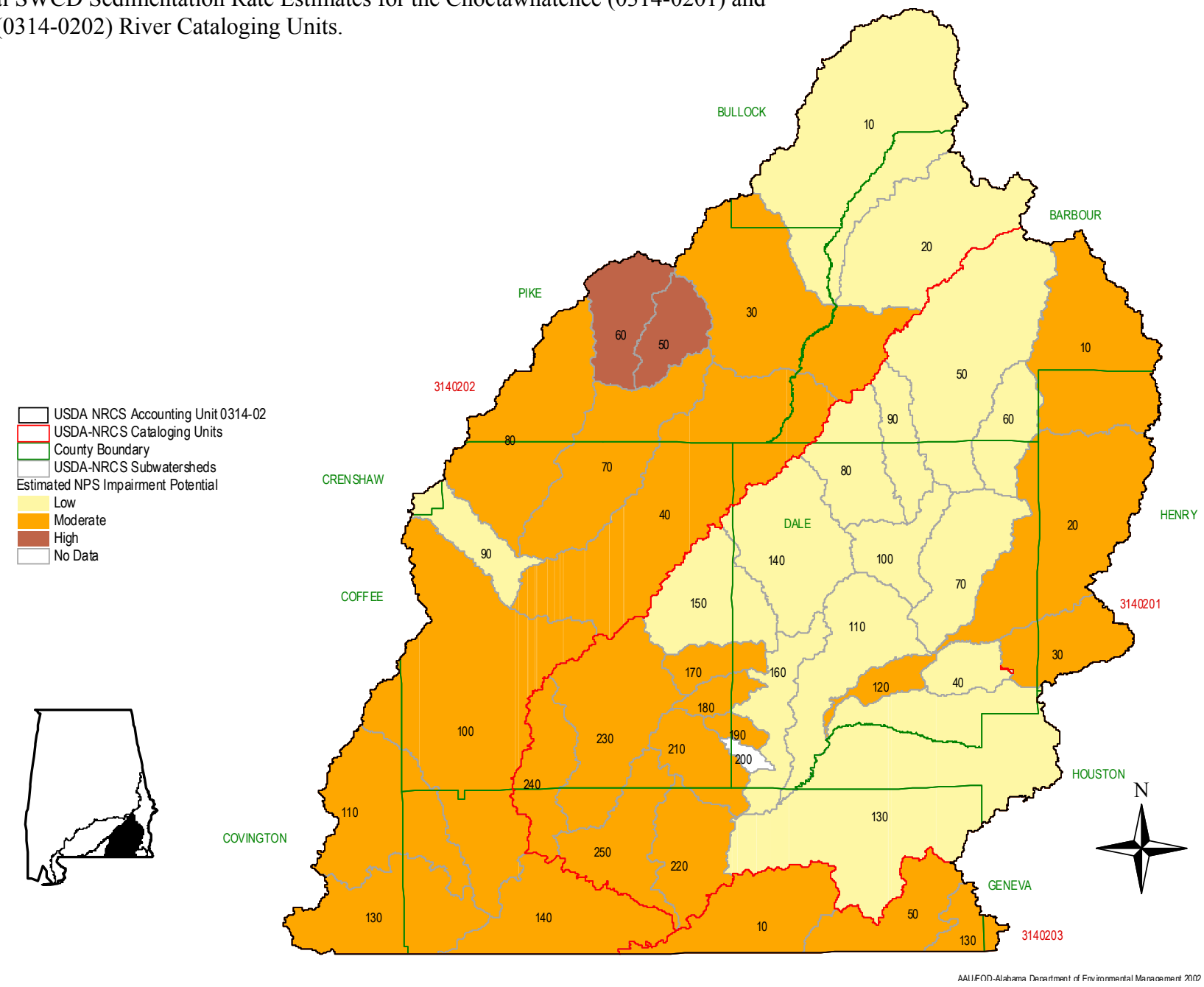


Figure 2c. Estimates of NPS Impairment Potential from Sedimentation Based Upon Local SWCD Sedimentation Rate Estimates for the Choctawhatchee (0314-0201) and Pea (0314-0202) River Cataloging Units.



Choctawhatchee Accounting Unit (0314-02)

Figure 2d. Estimates of NPS Impairment Potential from Aquaculture Activities Based Upon Local SWCD Aquaculture Acreage Estimates for the Choctawhatchee (0314-0201) and Pea (0314-0202) River Cataloging Units.

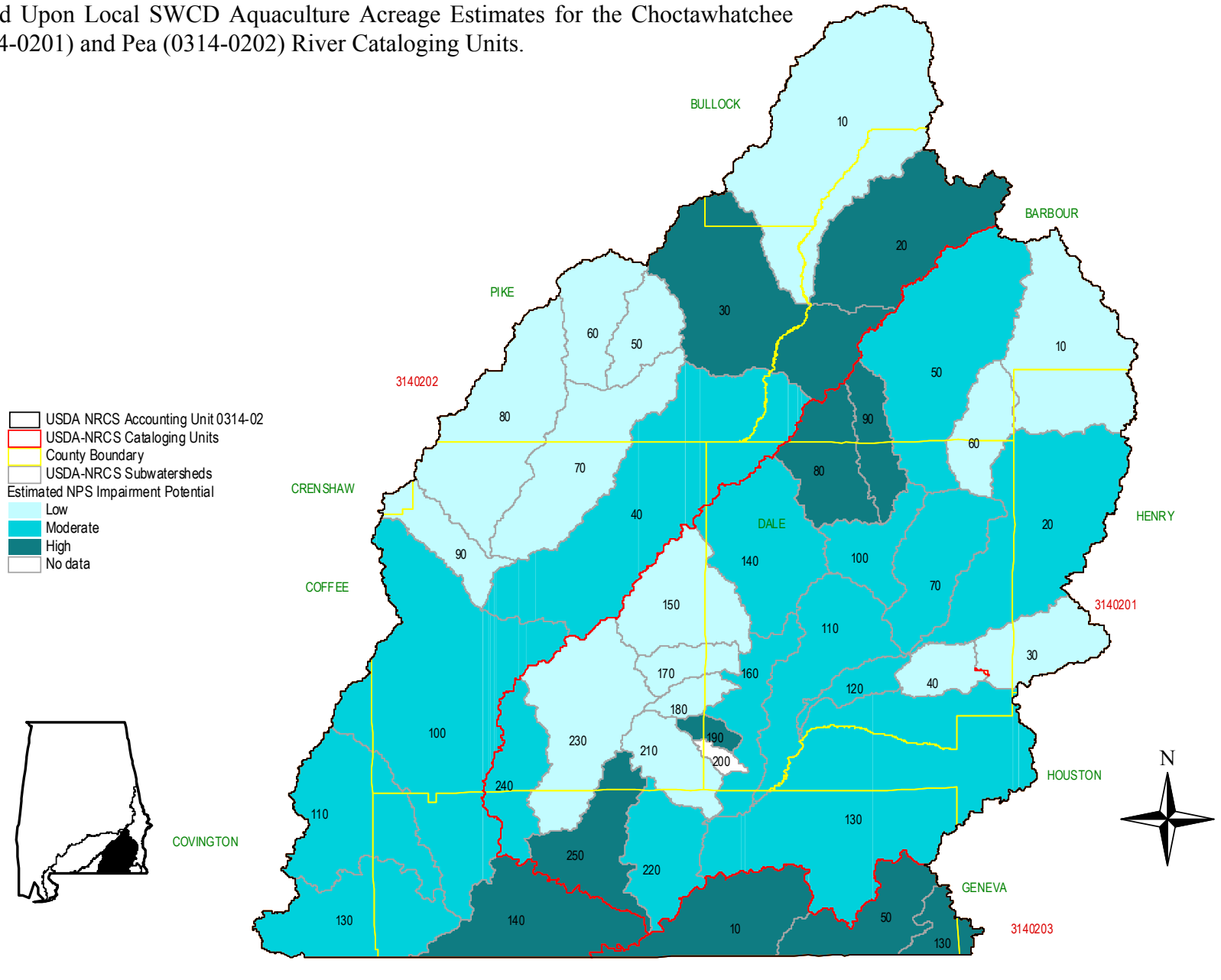


Figure 2e. Estimates of NPS Impairment Potential from Row Crop Land Use Based Upon Local SWCD Land Use Estimates for the Choctawhatchee (0314-0201) and Pea (0314-0202) River Cataloging Units.

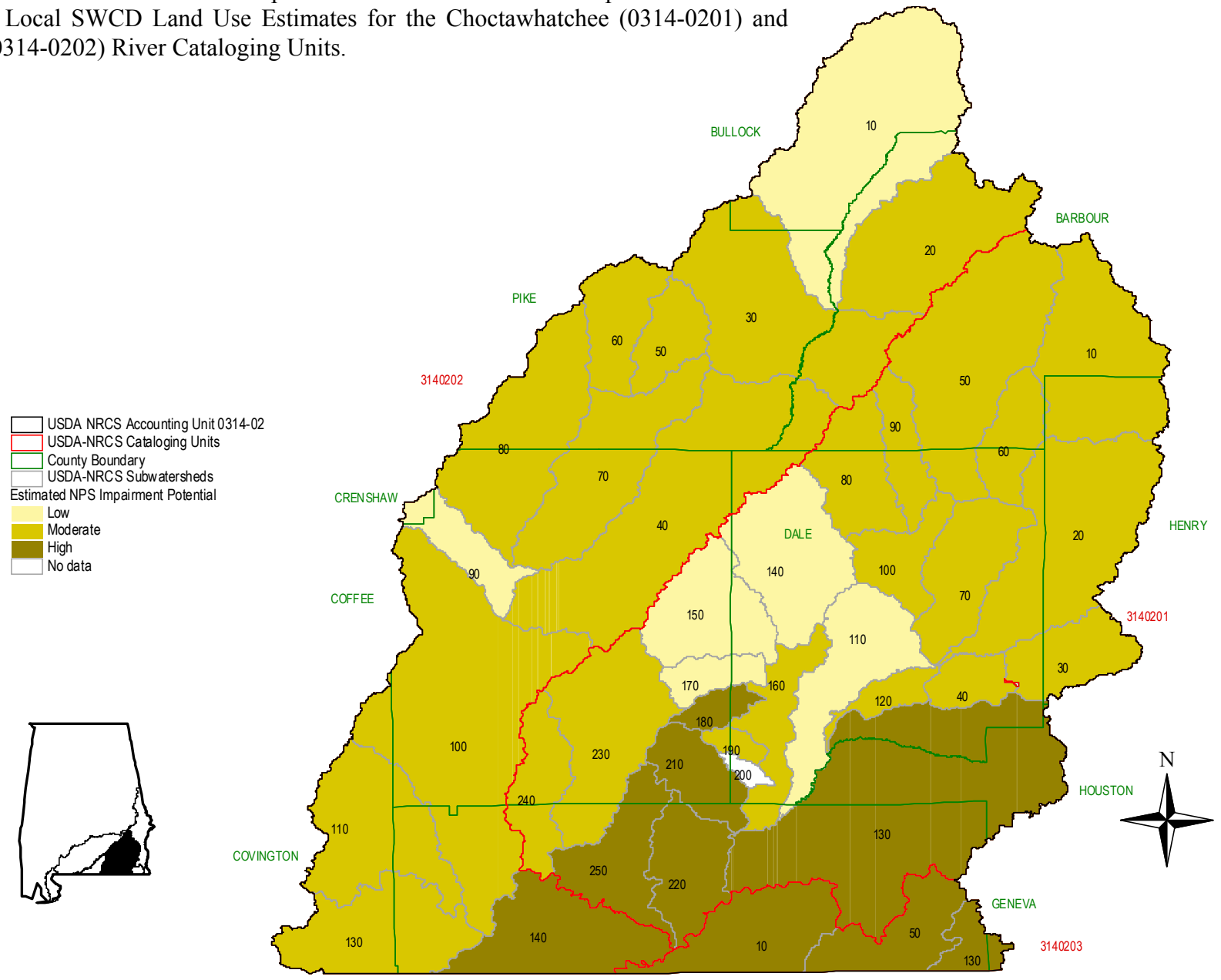


Figure 2f. Estimates of NPS Impairment Potential from Pasture Land Use Based Upon Local SWCD Landuse Estimates for the Choctawhatchee (0314-0201) and Pea (0314-0202) River Cataloging Units.

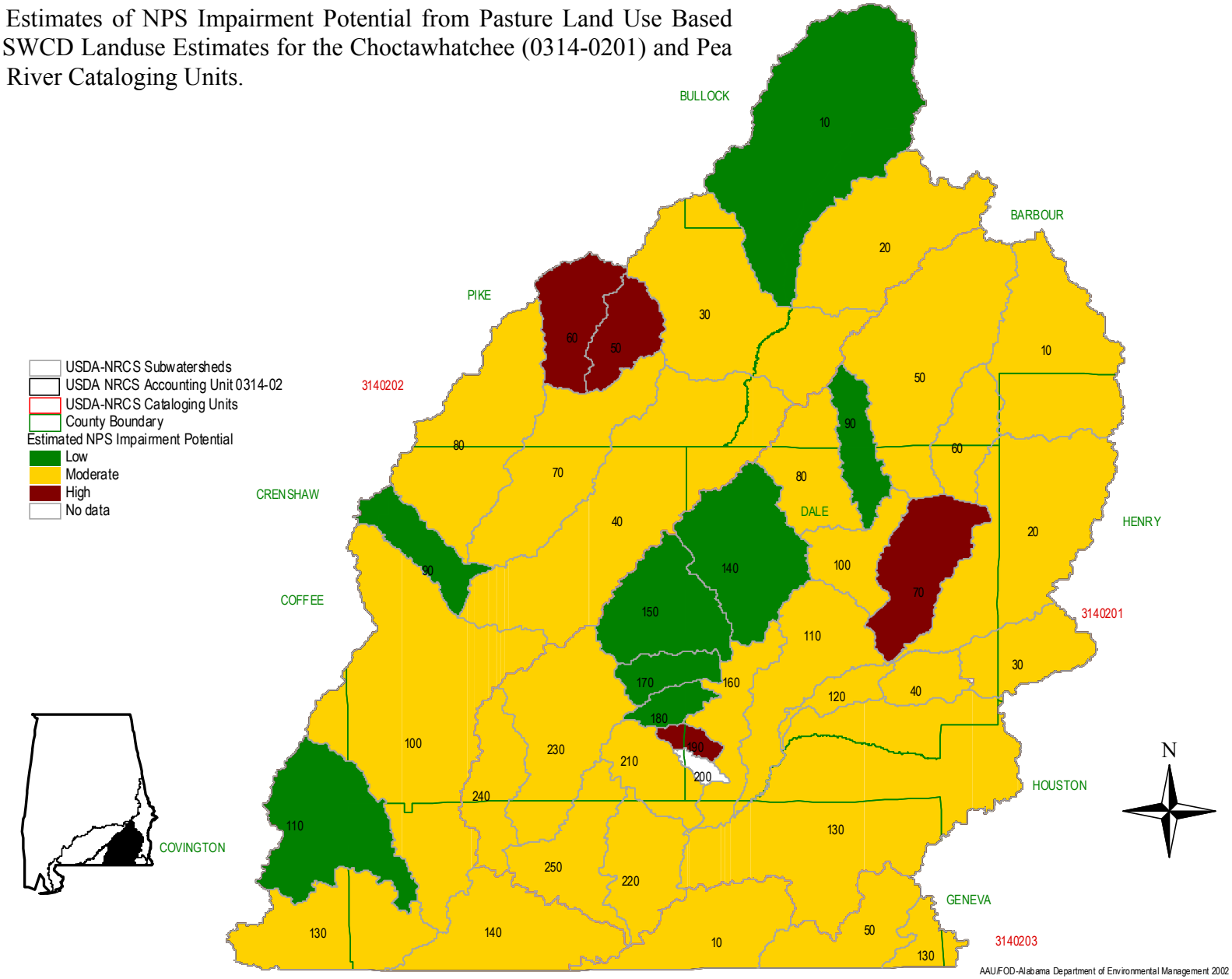


Figure 3. Level IV Southeastern Plains (65) Ecoregions of the Choctawhatchee (0314-0201) and Pea (0314-0202) River Cataloging Units.

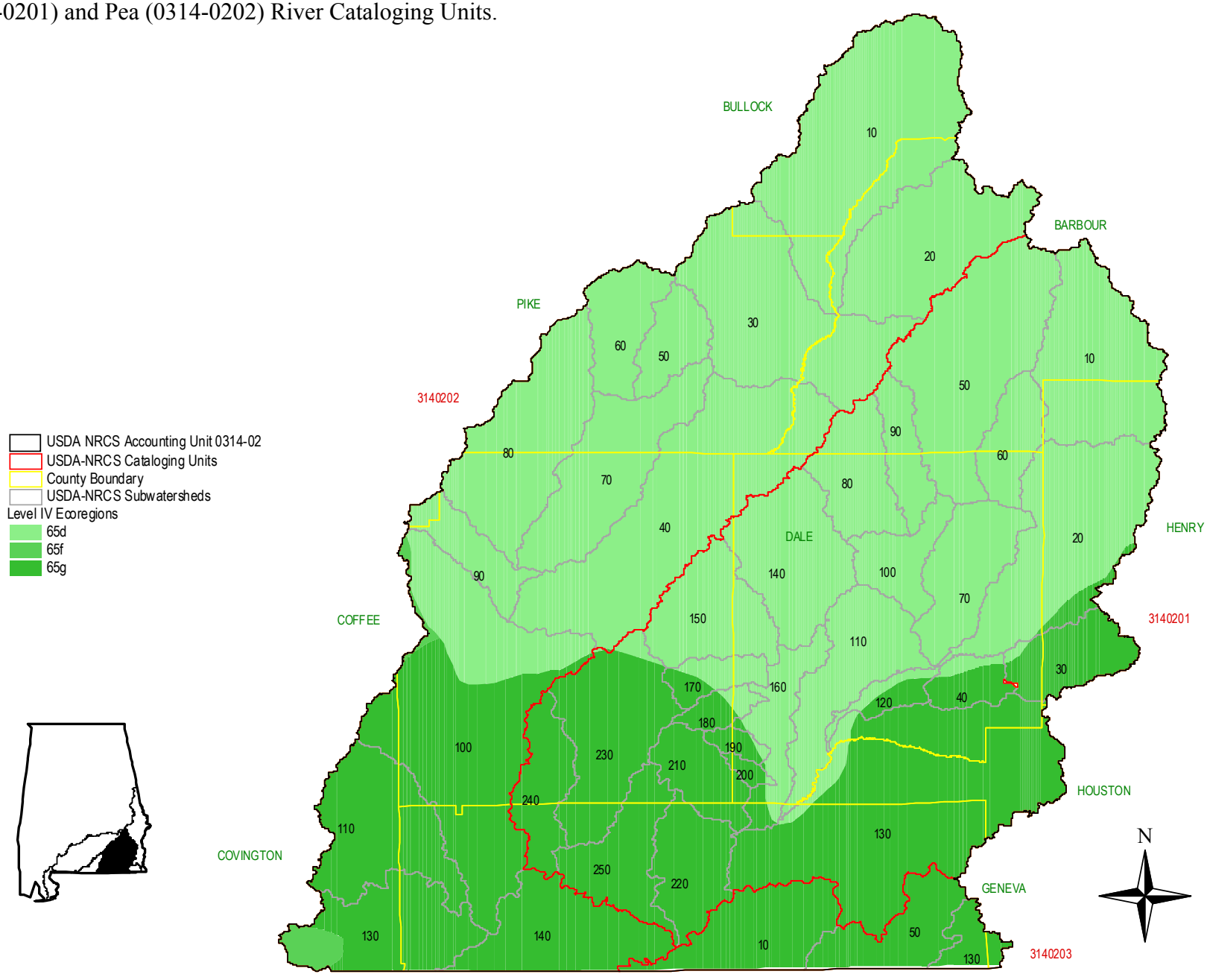


Figure 4a. Habitat and Aquatic Macroinvertebrate Assessments Conducted in the Choctawhatchee (0314-0201) and Pea (0314-0202) River Cataloging Units.

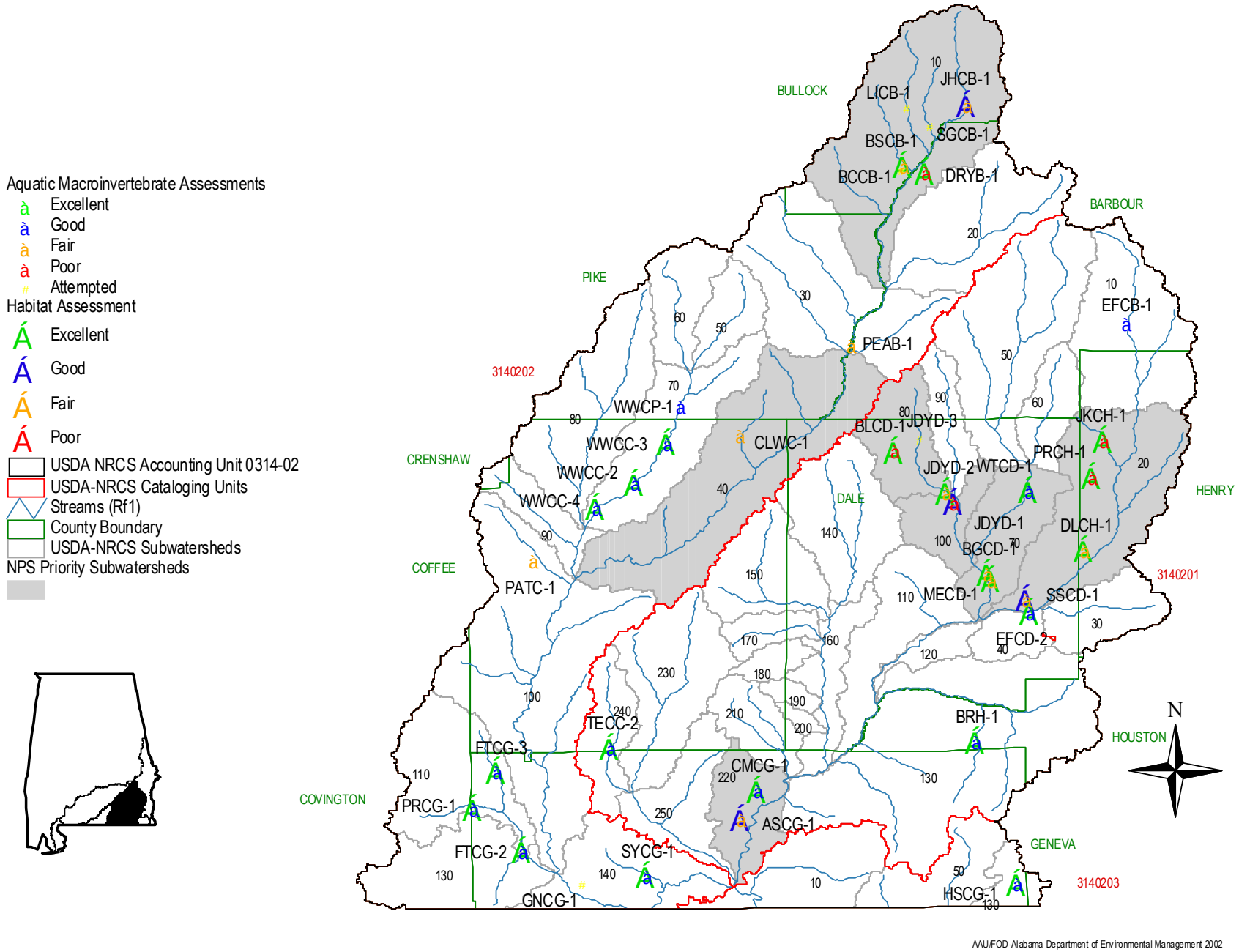


Figure 4b. Fish Community IBI Assessments Conducted in the Choctawhatchee (0314-0201) and Pea (0314-0202) River Cataloging Units.

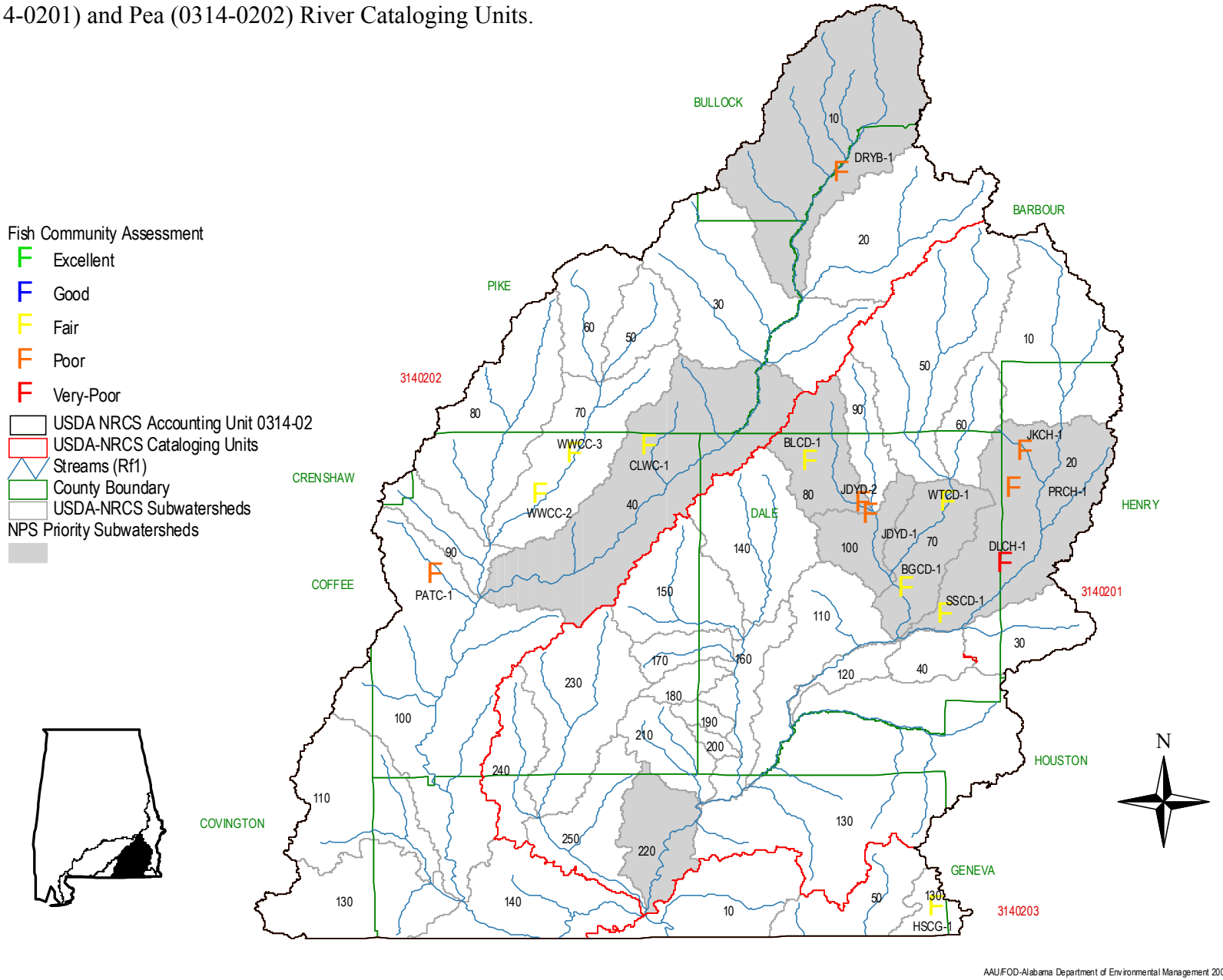
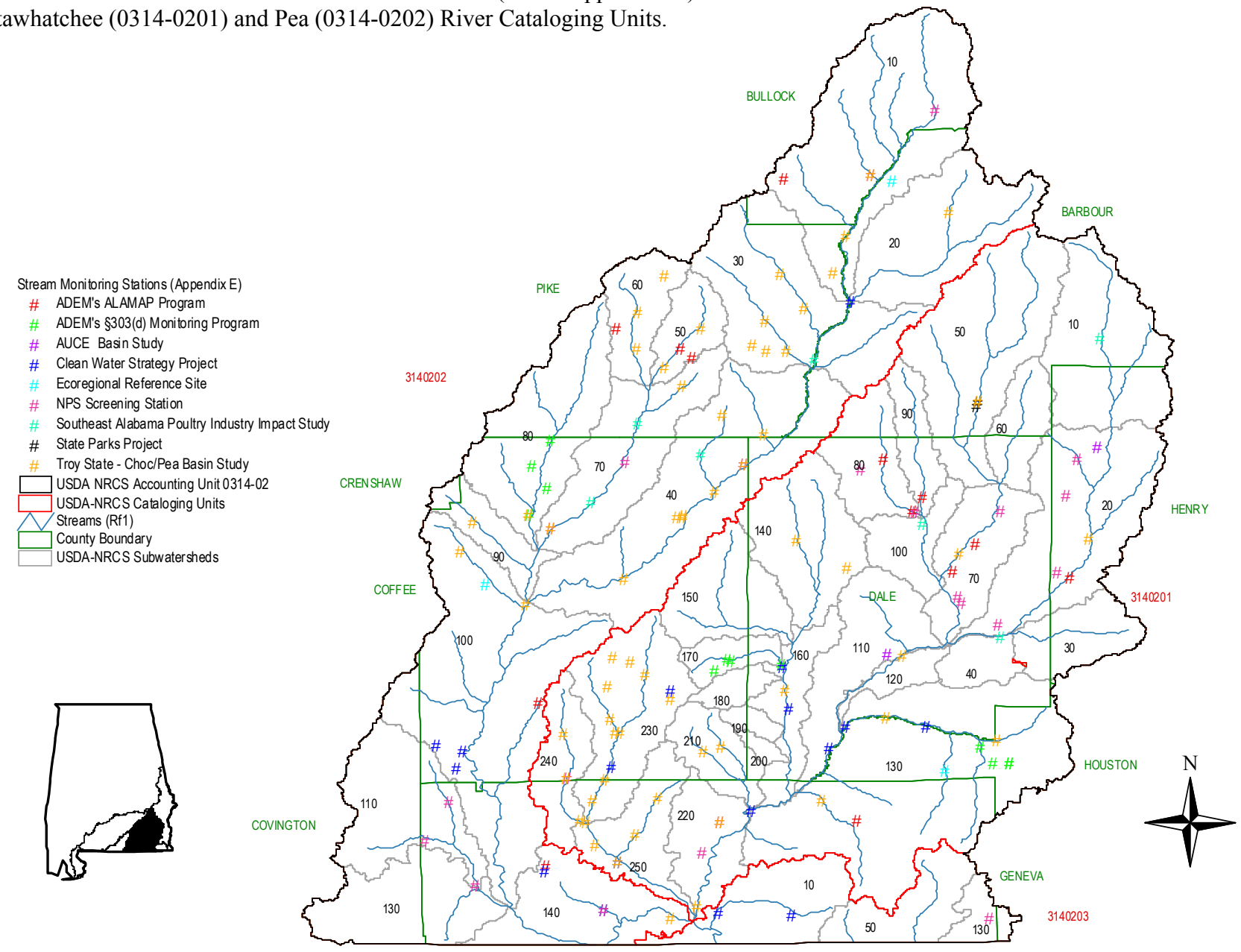


Figure 5. Stream Stations Assessed from 1989-1999 (From Appendix E) in the Choctawhatchee (0314-0201) and Pea (0314-0202) River Cataloging Units.



ACKNOWLEDGEMENTS

Thank you to Dr. Patrick O'Neil of the Geological Survey of Alabama for efforts in helping develop Fish IBI metrics for the Southeast Alabama Basins. Thank you to Vic Payne, the State Soil and Water Conservation Committee, and the Local Soil and Water Conservation Districts (SWCDs) in the Southeast Alabama Basins for providing the Conservation Assessment Worksheet information for inclusion in this report. Thank you to Mike Mullen of Troy State University for sharing the data collected in the Choctawhatchee River Basin.

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LIST OF ABBREVIATIONS

Abbreviation	Interpretation
§	Section
ADEM	Alabama Department of Environmental Management
ALAMAP	Alabama Monitoring Assessment and Program
AU	Animal Unit as defined by ADEM CAFO Rules
Br	Branch
CAFO	Concentrated Animal Feeding Operation
cfs	Cubic Feet per Second
Chem.	Chemical/Physical Water Quality
Co.	County
Confl.	Confluence
Cr	Creek
CWA	Clean Water Act
CWAP	Clean Water Action Plan
CWS	Clean Water Strategy
ds	Downstream
EIS	Environmental Indicators Section of ADEM's Field Operations Division
EPA	U.S. Environmental Protection Agency
FOD	Field Operations Division
GSA	Geological Survey of Alabama
IBI	Index of Biotic Integrity (fish community)
Macroinv.	Aquatic Macroinvertebrate
mg/l	Milligrams per Liter
mi^2	Square miles
Mod.	Moderate
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source
nr	Near
R	River
Rd	Road
RM	River Mile
SAPIIS	Southeast Alabama Poultry Industry Impact Study
SSWCC	State Soil and Water Conservation Committee
SWCD	Soil and Water Conservation District
TMDL	Total Maximum Daily Load
ug/g	Micrograms per Gram
ug/l	Micrograms per Liter

INTRODUCTION

The Alabama Department of the Environmental Management (ADEM) is charged with monitoring the status of the state's water quality pursuant to the Clean Water Act and the Alabama Water Pollution Control Act. Under the Clean Water Act (CWA) of 1977, the EPA emphasized programs addressing the chemical contamination of the nation's waters (National Research Council 1992). State and federal programs initiated to meet these water quality guidelines have been largely successful in controlling and reducing certain kinds of chemical pollution from point source discharges (National Research Council 1992, ADEM 1996c). The detection, assessment, and control of impairment from point sources is fairly well understood because the pollutants, their concentrations, and probable points of impact are known (National Research Council 1992, USEPA 1997a)

Nonpoint source (NPS) pollution, defined as any unconfined or diffuse source of contamination, accounts for approximately two-thirds of the water quality impairments in Alabama's streams (ADEM 2001a). It is generated irregularly and often associated with storm water runoff or atmospheric deposition (USEPA 1997a). Nonpoint source impairment is associated with land-use within a watershed, such as agriculture, silviculture, and mining. The pollutants, their concentrations, and/or their source(s) may not be known or well defined. Because of their transient nature, these pollutants may not be detected by periodic water quality measurements (National Research Council 1992).

The 1987 amendments to the Clean Water Act added section 319, which established a national program to assess and control nonpoint source pollution. Under this program, states are asked to assess their nonpoint source pollution problems and submit these assessments to USEPA. In 1996, ADEM adopted a basin-wide approach to water quality monitoring using a 5-year rotating basin group cycle. Concentrating monitoring efforts within one basin provides the Department with a framework for more centralized management and implementation of control efforts and provides consistent and integrated decision making for awarding CWA §319 NPS funds.

In 1997, the Aquatic Assessment Unit (AAU) of the Field Operations Division developed basin-wide screening assessment methods that could be used to identify sub-watersheds with the highest potential for NPS pollution, assess water quality within selected sub-watersheds, and prioritize sub-watersheds most impaired by NPS pollution. The projects are completed in 4 phases. During Phase I, landuse information, Departmental regulatory databases, available historical data, and other assessment information are used to identify data gaps and to prioritize sub-watersheds with the greatest potential for NPS impairment. During Phase II, selected sites are assessed using macroinvertebrate and fish community assessments, habitat assessments, and collection of chemical data. Assessments are based on long-term data from ADEM's Ecoregional Reference Site Program. During Phase III, data collected during Phase II, as well as existing data and assessment information, are analyzed to evaluate the level of impairment within each sub-watershed and determine the cause and source of impairment. A comprehensive report is completed during the final phase.

The AAU has completed basin-wide NPS screening assessments of the Black Warrior (1997) and Tennessee (1998) basins. The results of the studies have been reported in two separate documents (ADEM 1999i, ADEM 2000g). During 1999, the AAU completed a basin-wide screening assessment of the Chattahoochee, Choctawhatchee, Chipola, and Perdido-Escambia River basins. The goal of the project was to provide data that can be used by the Department to prioritize sub-watersheds most impaired by nonpoint source pollution and to use resources most effectively by directing BMP implementation and demonstration within priority sub-watersheds.

METHODOLOGY

Study Area

The Choctawhatchee River Basin encompasses ten counties in southeast Alabama. The area includes 3 hydrologic cataloging units, and 41 sub-watersheds. The Choctawhatchee River Basin in Alabama has 3,130 mi^2 of drainage that flows through Bullock, Barbour, Henry, Houston, Geneva, Dale, Pike, Coffee, Crenshaw, and Covington Counties. (USDASCS 1995).

Ecoregions

The Choctawhatchee basins is located in the *Southeastern Plains (65)* ecoregions (Fig. 3).

Southeastern Plains (65): The flat to undulating ***Blackland Prairie*** (65a) is characterized by distinctive Cretaceous-age chalk, marl, and calcareous clay with poor drainage. Stream flows tend to vary with both season and rainfall. Elevations are generally 150-250 feet. The area's natural vegetation of sweetgum, post oak, red cedar, and blue stem prairie has been transformed to cropland and pasture, with small patches of mixed hardwoods. Pond-raised catfish aquaculture has increased in recent years.

The ***Flatwoods/Blackland Prairie Margins*** (65b) subecoregion combines two slightly different areas. The Flatwoods are comprised of a mostly-forested lowland area of little relief, formed primarily on dark, massive marine clay. Soils are deep, clayey, somewhat-poorly to poorly drained, and acidic. The Blackland Prairie Margins are undulating, irregular plains, with slightly more relief than the Flatwoods, but also tend to have heavy clay soil that are sticky when wet, hard and cracked when dry, with generally poor drainage.

The ***Southern Hilly Gulf Coastal Plain (65d***) drains portions of the Lower Alabama River CU. This subecoregion is characterized by dissected irregular plains and gently rolling hills. It developed over diverse east-west trending bands of sand, clay, and marl formations. Broad cuestas with gentle south slopes and steeper north facing slopes are common, and the heterogeneous region has a mix of clayey, loamy and sandy soils. It has more rolling topography, higher elevations, and more relief than 65a, 65b, and 65g and higher-gradient streams. The natural vegetation of oak-hickory-pine forest grades into southern mixed forest to the south. Land cover is mostly forest and woodland with some cropland and pasture.

The ***Dougherty Plains (65g*)** subecoregion is located in the Dougherty Plains of Southeast Alabama. These are flat to rolling plains with elevations generally 100-300 feet. Soils are sandy to clayey over residuum geology derived from solution and collapse of limestone. The streams in this area are characterized by braided channels and slightly to moderately tannic water. The floodplains are large with low stream banks and shaded channels.

The southern most section of the Chattahoochee and Chipola basins fall within the ***Fall Line Hills (65i)*** subecoregion. This area is composed primarily of Cretaceous age loamy and sandy sediments. It is mostly forested terrain of oak-hickory-pine on hills with 200-400 foot relief. Longleaf pine is being reintroduced in many areas. The area around the Talladega National Forest in west Alabama provides a major stronghold for the endangered red-cockaded woodpecker.

The ***Southeastern Floodplains and Low Terraces (65p)*** comprise a riverine ecoregion of large sluggish rivers and backwaters with ponds, swamps, and oxbow lakes. Within these basins, the subecoregion defines a corridor running along the Chattahoochee River. River swamp forests of bald cypress and water tupelo and oak-dominated bottomland hardwood forests provide important

wildlife corridors and habitat. In Alabama, cropland is typical on the higher, better-drained terraces, while hardwoods cover the floodplains.

Four different soil regions influence the basins of Southeast Alabama. The majority of the area is influenced by Coastal Plain soils with the northern portions of the area draining primarily the Piedmont Plateau, and Blackland Prairie soils. Flood plain soils influence drainage in areas of the southern tier counties along the Choctawhatchee and Conecuh Rivers (NRCS 1997).

Underlying geologic formations are among factors that influence natural water quality. Alabama has five major physiographic sections: the Highland Rim, the Cumberland Plateau, the Alabama Valley and Ridge, the Piedmont Upland and the East Gulf Coastal Plain. Physiography Sections within the area of study include the Piedmont Upland and the East Gulf Coastal Plain. The Piedmont Upland Section is the non-mountainous section of the "older Appalachians". Piedmont geology is complex, consisting of high and low grade metamorphic and igneous rocks, including quartzite, phyllite, slate, schist, amphibolite and gneiss. Streams of this section flow over bedrock between steep hillsides. They are generally swift and have high gradients. The East Gulf Coastal Plain Section is characterized by gentle rolling hills, sharp ridges, prairies and broad alluvial floodplains. The greater part of this section is underlain by permeable sands and gravel, which have excellent water bearing properties. Streams in this section are generally slow and have muddy sand bottoms. (Mettee, O'Neil, Pierson 1996)

Preliminary Selection of Subwatersheds

Subwatershed selection included review of data from previous assessments conducted in southeast Alabama basins to concentrate efforts in areas not recently assessed. Additionally, Departmental municipal and industrial databases were reviewed to screen out areas primarily impacted by point sources. Subwatersheds were not considered for assessment if they were not primarily located in Alabama or were relatively small (<30 mi^2) (USDASCS 1995). The potential for NPS impairment was estimated for each sub-watershed using data compiled by the Local Soil and Water Conservation Districts (SWCD). Twenty-seven subwatersheds were selected for NPS Screening Assessments based on locations of previous assessments, concentrated point sources and analysis of Conservation District data. In addition, sampling was coordinated among projects, such as ALAMAP (Alabama Monitoring and Assessment Program), 303(d) stream monitoring, the Middle Chattahoochee Water Quality Study and the Southeast Alabama Poultry Industry Impact Study to maximize the number of streams assessed and to prevent duplication of effort.

The Alabama Soil and Water Conservation Committee (ASWCC) and local soil and Water Conservation Districts (SWCD) provided ADEM with estimates of land use, animal populations and sedimentation rates on conservation assessment worksheets completed by each county during 1998 (FY97 CWA 319 Workplan Project #4) (Tables 2, 3, and 4). Additional land-use information was obtained from EPA published estimates of percent land cover for the entire southeastern U.S. (EPA 1997a). Four criteria were used to screen the list of potential subwatersheds for assessment:

1. Ranked as a priority (1-5) by the SWCD;
2. Urban area <20%;
3. Cattle present; and,
4. Septic tanks/ acre <0.04

Nonpoint Source Impairment Potential

Although unavailable for use during the preliminary selection process, the land use percentages and estimates of animal populations and sedimentation rates provided by the local SWCD were used to assess the potential for NPS impairment within each subwatershed. SWCD land use estimates, including % cropland, % pasture land, % mining, and total soil erosion rates

(tons/acre/year) were evaluated. Three categories provided by the SWCD were added to assess the potential for impairment from forestry practices: % acres clear cut, % of acres harvested annually, and % of forest needing improvement.

The potential for NPS impairment from activities associated with animal husbandry was also evaluated. Potential of impairment among the different types of animals was standardized by converting animal populations estimates into animal densities. Animal Unit estimates were calculated for each of the animal types based on the current conversion factors found in ADEM Administrative Code Chapter 335-6-7 (CAFO Program Rules). These values considered characteristics such as live weight equivalent waste quantity and constituent composition (limiting nutrients, moisture, additive compounds, etc.). (ADEM 1999b).

Table 1a. Current Conversion Factors found in ADEM Admin. Code Chapter 335-6-7 (CAFO Program Rules).

Animal Type (CAFO Definition)	Numbers of Animals	Animal Unit (AU) Equivalent
Cattle (slaughter, feeder, dairy heifers)	1	1.0
Dairy (mature)	1	1.4
Swine (>55 lbs)	1	0.4
Poultry (Broiler & Layer)	125	1.0

Percent urban land, number of current construction/stormwater authorizations, and septic tanks were used to identify subwatersheds potentially impacted by urban landuses.

The sub-watershed values for each category were rated as H(igh)=5, M(oderate) =3, and L(ow)=1. For each category, the range of values used for a subwatershed's impairment potential was defined by calculating the mean and standard deviation of subwatersheds within the Southeast Alabama river basins. A value less-than-or-equal-to the calculated mean was assigned a "Low" potential. Values greater than the mean, but equal-to-or-less-than one-standard deviation above the mean were assigned a "Moderate" potential and values greater than one-standard deviation above the mean were assigned a "High" potential for NPS impairment.

For each subwatershed and cataloging unit, the potential for the 7 rural nonpoint source categories were summed to rate overall NPS impairment potential. Scores greater than the 90^{th} percentile were rated as High; scores greater than the 50^{th} percentile, but less than the 90^{th} percentile were Moderate; scores less than the 50^{th} percentile were Low. In addition, subwatersheds and cataloging units that scored in the low range, but received a moderate rating in at least one category were rated as moderate for overall NPS potential.

Subwatersheds and cataloging units that scored in the moderate range, but received a high rating in at least two categories were rated as high for overall NPS potential. Subwatersheds ranked as high in both rural and non-rural NPS potential were further evaluated to determine the point-source location in relation to potential assessment sites.

Table 1b. Range of values used to define Low, Moderate, and High potential for impairment for each rural NPS category.

Category	**Low**	**Moderate**	**High**
% Cropland	<16%	16% to 39%	>39%
% Pastureland	<9%	9% to 20%	>20%

% Mining	<0.1%	0.1% to 0.4%	>0.4%
% Forestry Practices	<21%	21% to 49%	>49%
% Aquaculture	<0.01%	0.01% to 0.05%	>0.05%
Animal Units/acre	<0.08	0.08 to 0.19	>0.19
Sedimentation rate (tons/ acre)	<4	4 to 12	>12
Overall Rural NPS Potential	**<10**	**10 to 17**	**>17**

Table 1c. Range of values used to define Low, Moderate, and High potential for impairment for each non-rural NPS category.

Category	Low	Moderate	High
% Urban	<4%	4% to 14%	>14%
# construction/ stormwater authorizations	<3	3 to 6	>6
Failing septic tanks/acre	<0.01	>0.01	---

The nonpoint source categories and ranges used for the Southeast Alabama Basins may not be applicable to water quality conditions and activities in other basins of the State. They are intended to be descriptive, but are open to differing interpretations considering alternative data analysis techniques and are subject to refinement as data availability and analysis warrants.

The local SWCD also evaluated streams for each of the sub-watersheds located in their respective counties. These evaluations were discussed during public meetings and were used to rank the sub-watersheds as to their perceived priority for conducting water quality improvement projects. The 1st priority was given to the sub-watershed with the greatest need. A single sub-watershed may have more than one priority, if two or more of the counties containing the sub-watershed gave it a top-five priority ranking. This information was used to supplement the sub-watershed estimates of NPS impairment potential (Tables 5 and 15).

Habitat Assessment

Biological condition of the fish and aquatic macroinvertebrate communities is generally correlated with the quality of available habitat (without considering influences of water quality). The presence of stable and diverse habitat usually will support a diverse and healthy aquatic fauna (Barbour and Stribling 1991). Habitat quality was therefore assessed at each site to evaluate stream condition and to assist in the interpretation of biological data (Tables 6a, 6b, 6c, 6d). Primary, secondary, and tertiary habitat parameters were evaluated to assess overall habitat quality at each site. Primary habitat parameters evaluate the availability and quality of substrate and instream cover. They include those characteristics that directly support aquatic communities, such as substrate type, stability, and availability. Secondary habitat parameters evaluate channel morphology, which is determined by flow regime, local geology, land surface form, soil, and human activities. Channel morphology indirectly affects the biological communities by affecting sediment movement through a stream (Barbour and Stribling 1991). Secondary habitat parameters include an evaluation of flow regime, sinuosity/instream geomorphology, and sediment deposition and scouring. Tertiary habitat characteristics evaluate bank structure and riparian vegetation. Bank and riparian vegetation prevent bank erosion and protect the stream from stormwater runoff from impervious surfaces. The presence of overhanging riparian vegetation also determines the primary

energy source for aquatic macroinvertebrate communities—the base of the fish food chain (Vannote et al. 1980). Tertiary parameters include bank condition, bank vegetative protection, and riparian zone width.

The revised EPA habitat assessment forms evaluate riffle/run (Appendix B-1) and glide/pool (Appendix B-2) streams separately (EPA 1997b). The primary habitat parameters of the glide/pool habitat assessment place more emphasis on habitat characteristics important to this stream-type, primarily pool structure and variability. Because the revised habitat assessment forms more accurately assess habitat quality and degradation to glide/pool streams, the ADEM began using the revised forms in 1996 (ADEM 1996c). In addition, because they measure impairment to habitat quality, the scores (converted into percent maximum) were comparable between stream types and can be used to evaluate streams throughout the basin.

One physical characterization sheet was filled out at each station (Appendix C). Depending upon stream geomorphology, each team member completed a riffle/run or glide/pool habitat assessment.

Aquatic Macroinvertebrate Assessment: Multi-habitat EPT Method

The aquatic macroinvertebrate communities were assessed at all wadeable sites during May and June 1999 (Tables 7a, 7b, 7c, 7d). A modified multihabitat EPT bioassessment method was used to evaluate the integrity of the aquatic macroinvertebrate communities (ADEM 1996c). The multihabitat EPT method is a screening technique used in watershed screening assessment studies. Since assessments were conducted at multiple sites over a large area, collection effort and analysis time were decreased by processing the samples in the field and focusing on the collection of the pollution sensitive Ephemeroptera, Plecoptera, and Trichoptera (EPT) taxa. EPT taxa were collected from all productive in-stream habitats available at each sampling site. These included: riffles, CPOM (course particulate organic matter), rocks and/or logs, undercut banks, and sand. The samples collected from each habitat were field processed and returned to the laboratory for identification. The total number of EPT families collected from each station was compared to EPT Index data collected from least-impaired ecoregional reference sites to indicate the health of each stream. A designation of *excellent, good, fair, or poor* was assigned to each station.

Fish Community Index of Biotic Integrity (IBI) Assessment

Fish community assessments were conducted during July 1999 (Tables 7a, 7b, 7c, 7d). The fish assessments were conducted at established reference sites, and stream reaches in which the aquatic macroinvertebrate assessment borders between two impairment categories. The sampling protocol, developed by Geological Survey of Alabama (O'Neil and Shepard 1998), uses a time based multihabitat approach. A 3-person crew sampled all available habitat including riffles, snags, pools, runs and rootbanks, using an 8 ft long, 3/16 inch mesh minnow seine and backpack electro-shocker. Each sample required 30 to 40 minutes to complete. Samples were fixed with ten percent (10%) formalin and transported to the laboratory. At the laboratory samples were identified to species, counted, weighed and preserved in seventy-percent (70%) ethanol.

The data were analyzed using twelve (12) metrics of the fish community related to species richness (# of species) and composition, trophic composition, fish abundance and condition. The total number of fish captured was standardized to catch per hour for purposes of calculating one metric. Each metric was given a score according to the associated criteria and totaled to determine the Index of Biotic Integrity (IBI) score. The integrity of the fish community was determined to be *excellent, good, fair, poor, or very poor* based on the total IBI score.

Chemical Assessment

Water chemistry samples were analyzed for selected parameters used as indicators of impairment from land-uses present within the Southeast Alabama river basins. These include sedimentation (total suspended solids, total dissolved solids), nutrient enrichment (total phosphate, nitrate/nitrite, BOD_5), and metals (Appendices D-1, D-2).

Stream flow estimates, routine field parameters, and water quality samples were collected at twenty-seven stations in July 1999 (Appendices D-1, D-2). Additional sampling events were conducted during 1999 as part of other projects such as ALAMAP, 303(d) stream monitoring, and the Southeast Alabama Poultry Industry Impact study (Appendices F-5, F-6, F-8, and F-9). Chemical analyses of water samples were conducted by the ADEM's Central Laboratory in Montgomery. Water quality samples for laboratory analysis were collected, preserved, and transported to the ADEM Laboratory as described in ADEM Field Operations Standard Operating Procedures and Quality Control Assurance Manual, Volume I - Physical/Chemical (1994a). Duplicate field parameters and samples were collected during ten percent (10%) of the sampling events.

Chain of Custody

Sample handling and chain-of custody procedures were used for all biological and chemical samples as outlined in ADEM Field Operations Standard Operating Procedures and Quality Control Assurance Manual, Volumes I and II to ensure the integrity of all samples collected (1994a, 1996c).

Final Assessment and Ranking of Sub-watersheds

Fish and macroinvertebrate communities may respond to changes in water quality in different ways and to varying degrees over time. Consequently, monitoring changes in biological communities can detect impairment from nonpoint source pollution, which can be infrequent or low-level. The fish community seems particularly well suited to identifying impairments due to habitat modification. The macroinvertebrates provide more information about water column effects as potential causes of impairment. In addition, each group has different recovery rates with macroinvertebrates communities generally quicker to recover than fish communities.

The results of fish and aquatic macroinvertebrate assessments were used to identify priority sub-watersheds. Assessments of *poor* or *fair* for each assessment (severely impaired or moderately impaired) were used to designate priority sub-watersheds. Evaluations of physical/chemical data were made by comparing data to ecoregional reference sites and other streams in the same area (ADEM 1999i).

RESULTS

Upper Choctawhatchee CU (0314-0201)

Land use: The primary land-uses throughout the Upper Choctawhatchee cataloging unit were forestland and cropland (Table 12b). It contains 25 sub-watersheds located within Barbour, Coffee, Dale, Geneva, Henry and Houston Counties (Fig 3). The CU is located in the Southeastern Plains Ecoregion (Subecoregions 65d and 65f) and drains Coastal Plain soils (NRCS 1997). Three sub-watersheds contain segments on Alabama's 1998 §303(d) list of impaired waterbodies (Table 11c).

Percent land cover estimated by local SWCD (ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
47%	29%	14%	0%	5%	1%	3%

NPS impairment potential: Eight sub-watersheds were estimated to have a *high* potential for impairment from nonpoint sources. The main NPS concerns were runoff from animal production operations, pasture and row crops. Impairment from urban runoff and development was a concern within 9 sub-watersheds (Table 5c).

Number of sub-watersheds with (M)oderate or (H)igh ratings for each NPS category (Table 5a).

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Moderate	14	11	11	5	17	0	5	12
High	8	7	4	4	2	1	0	0

Number of sub-watersheds with (M)oderate or (H)igh ratings for each point source category (Table 5a).

Category	% Urban	Development	Septic tank failure
Moderate	5	7	0
High	6	3	0

Historical data/studies: Water quality assessments have been conducted recently within 13 of the 25 sub-watersheds within the cataloging unit (Table 8c). The majority of assessments were from studies conducted by ADEM, and Troy State University. In 1996, ADEM monitored 11 stations associated with its Clean Water Strategy (CWS) sampling efforts (Appendix F-10c). Three locations were monitored as part of the ADEM State Parks Assessment in 1998 (Appendix F-3c) (ADEM 1999d). Between 1997 and 1998, five sites were evaluated in conjuction with ADEM's ALAMAP Program (Appendix F-8c, F-9c) (ADEM 2000b). Three of the eight streams monitored in association with the Southeast Alabama Poultry Industry Impact Study are located within the Upper Choctawhatchee CU. The Center for Environmental Research and Service at Troy State University monitored 33 locations within the Upper Choctawhatchee Cataloging Unit (Appendix F-4c). A summary of each of these studies, including lead agency, project objectives, data collected, and applicable quality assurance manuals is provided with the appropriate appendices.

Assessments conducted: Table 10c lists the stations assessed in conjunction with the Southeast NPS Screening Assessment. Twelve stations located within the Lower East Fork Choctawhatchee (020), Lower West Fork Choctawhatchee (070), Upper Judy Creek (080), Choctawhatchee River (220) and Tight Eye Creek (240) sub-watersheds were assessed. Results of habitat and biological assessments are presented in Tables 6c and 7c, respectively. Chemical/physical data are provided in Appendices D-1a and D-2a.

Sub-watershed summaries: Current and historical monitoring data were used to provide a comprehensive assessment. A summary of the information available for both sub-watersheds is provided. Each summary discusses land use, NPS impairment potential, assessments conducted within the sub-watershed, and NPS priority rating based on available data. The summaries point out significant data and reference appropriate tables and appendices. Assessment of habitat, biological, and chemical conditions is based on long-term data from ADEM's Ecoregional Reference Site Program.

Sub-watershed assessments: Habitat, chemical/physical, and biological indicators of water quality were monitored at 20 stations located within 9 sub-watersheds (Table 13c). Habitat quality was generally assessed as *excellent* or *good* (Table 6c). Results of the macroinvertebrate assessments indicated the macroinvertebrate community to be in *good* condition at 6 (30%) stations, *fair* condition at 7 (35%) and *poor* at 7 stations (35%) (Table 7c). Fish community assessments were conducted at 9 of these stations (Table 7c). Results indicated the fish community to be in *fair* condition at 4 (44%) stations, *poor* at 4 (44%) stations and *very poor* at 1 station.

The overall condition for each station was rated as the lowest assessment result obtained (Table 13c). Five stations were assessed as *good*,7 stations were assessed as *fair*, 7 stations were assessed *poor,* and 1 station was assessed as *very poor.*

NPS priority sub-watersheds: A sub-watershed was recommended for NPS priority status if the macroinvertebrate or fish community was assessed as *fair* or *poor*. Bioassessment results indicated biological impairment to the macroinvertebrate and/or fish communities at 15 stations located within 7 sub-watersheds (Table 13c). These sub-watersheds were recommended for NPS priority status (Table 14c).

Sub-Watershed: Upper East Fork Choctawhatchee	NRCS Sub-Watershed Number 010

Station	Assessment Type	Date	Location	Area (mi2)	Class.
EFCB-1	C, H, M	1998, 1999	East Fork Choctawhatchee River @ Al HWY 131	32	F&W

Land use: The Upper East Fork Choctawhatchee sub-watershed drains approximately 111 mi^2 in Barbour and Henry Counties. The main land uses were estimated as forest, row crops, and pasture (Table 2c). There are 2 current construction/stormwater authorizations and 43 mining NPDES permits in the sub-watershed (Table 9c).

NPS impairment potential: There was a *moderate* potential for impairment associated with animal husbandry activities, sedimentation, and runoff from cropland and pasture (Table 5c). There was a *high* potential for impairment from mining sources. Overall potential for NPS impairment was *high* (Table 5c).

Assessments: An assessment was not conducted within the sub-watershed during the Southeast Alabama basins NPS screening assessments. However, East Fork of the Choctawhatchee River was assessed at EFCB-1 during ADEM's Southeast Alabama Poultry Industry Impact Study. Macroinvertebrate community surveys were conducted in 1998 and 1999 by Auburn Universities Fisheries Department staff. EIS staff collected water chemistry from August 1998 through September 1999 (Appendix F-6c). A complete station description is provided in Appendix E-1c.

Sub-Watershed: Lower East Fork Choctawhatchee	NRCS Sub-Watershed Number 020

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
CW04U2-7	H,C	1998	East Fork Choctawhatchee 10.6 mile upstream of Blackwood Creek		F&W
EFC(AU005)	C	1999	East Fork Choctawhatchee River @ AL HWY 10	116	F&W
TSCP-11	C	1994-1996	East Fork Choctawhatchee River @ AL HWY 27	164	F&W
DLCH-1	C, H, M, F	1999	Deal Creek @ Henry Co. Rd. 62	10	F&W
JKCH-1	C, H, M, F	1999	Jack Creek @ Henry Co. Rd. 75	6	F&W
PRCH-1	C, H, M, F	1999	Panther Creek @ Henry Co. Rd. 40	12	F&W
SSCD-1	C, H, M, F	1999	Seabes Creek @ Dale Co. Rd. 44 & 67	7	F&W
EFCD-2	C, H, M, F	1998, 1999	East Fork Choctawhatchee River @ Dale Co. Rd. 67	237	F&W

Land use: The Lower East Fork Choctawhatchee sub-watershed drains approximately 139 mi^2 in Barbour, Dale, and Henry Counties. Land use was primarily forest, row crops, and pasture (Table 2c). Three current construction/stormwater authorizations and 2 industrial NPDES permits have been issued in the sub-watershed (Table 9c).

NPS impairment potential: The potential for impairment from animal husbandry and forestry activities, sedimentation, aquaculture, and runoff from cropland and pasture was *moderate* (Table 5c). The overall potential for impairment from nonpoint sources was estimated as *high* (Table 5c). The potential for impairment from urban development was estimated as *moderate* (Table 5c)

Assessments: Four stream reaches in this sub-watershed were assessed as part of the NPS screening assessment and one reach as part of the Southeast Alabama Poultry Industry Impact Study (Appendix F-6C).

Deal Creek: Deal Creek is a glide/pool stream located in the Southeastern Plains and Hills Subecoregion. Habitat and aquatic macroinvertebrate community assessments were conducted at DLCH-1 in May 1999. Water chemistry and fish community assessments were conducted at the Deal Creek site in July 1999. The sampling reach had a shaded canopy and was dominated by sand (~89%) with lesser amounts of detritus (~10%) and silt (~1%) substrates. Habitat quality was assessed as *excellent* using the glide/pool assessment matrix (Table 6c). Five EPT families were collected indicating a *fair* aquatic macroinvertebrate community (Table 7c). The fish community survey indicated the stream reach had a *very poor* fish community (Table 7c). Water quality data indicated some nutrient enrichment as compared to reference streams within the subecoregion (Appendices D-1c, D-2c, F-1c, and F-2c).

Jack Creek: Habitat and aquatic macroinvertebrate community assessments were conducted in May 1999. Water chemistry and fish community assessments were conducted in July 1999. The JKCH-1 sampling reach had a partly-open/partly-shaded canopy and was dominated by sand (~80%) with lesser amounts of detritus (~10%), clay (~7%) and silt (~3%) substrates (Table 6c). Habitat quality was assessed as *excellent* using the glide/pool assessment matrix (Table 6c). Four EPT families were collected indicating a *poor* aquatic macroinvertebrate community (Table 7c). The fish community was assessed as *poor* (Table 7c). The water samples collected in July did not indicate a cause of the biological community impairment (Appendix D-1c, D-2c).

Panther Creek: Habitat and aquatic macroinvertebrate community assessments were conducted in May 1999. Water chemistry and fish community assessments were conducted in July 1999. The PRCH-1 sampling reach had a shaded canopy and was dominated by sand (~85%) with lesser amounts of detritus (~10%), clay (~2%) and silt (~3%) substrates (Table 6c). Habitat quality was assessed as *excellent* using the glide/pool assessment matrix (Table 6c). Four EPT families were collected indicating a *poor* aquatic macroinvertebrate community (Table 7c). The fish community was assessed as *poor* (Table 7c). The water samples collected in July did not indicate a cause of biological community impairment (Appendix D-1c, D-2c).

Seabes Creek: Habitat and aquatic macroinvertebrate community assessments were conducted in May 1999. Water chemistry and fish community assessments were conducted in July 1999. The SSCD-1 stream reach was evaluated with a *good* habitat, *fair* macroinvertebrate and fish communities (Table 7c). The sampling reach, had a mostly open canopy and was dominated by sand (~77%) with lesser amounts of detritus (~18%), gravel (~3%) and silt (~2%) substrates (Table 6c). Habitat quality was assessed as *good* using the glide/pool assessment matrix (Table 6c). Five EPT families were collected indicating a *fair* aquatic macroinvertebrate community. The fish community sample indicated the stream reach to have a *fair* fish community (Table 7c). Water chemistry samples collected in July 1999 indicated organic and nutrient enrichment (Appendix D-1c, D-2c).

East Fork Choctawhatchee River: At EFCD-2, the East Fork Choctawhatchee River is a low-gradient stream reach located in the Southeastern Plains and Hills (65e) subecoregion (Table 6c). In 1999, habitat quality was assessed as *excellent* for this stream type and region (Table 6b). Ten EPT families were collected, indicating the aquatic macroinvertebrate community to be in good condition (Table 7c). An assessment conducted at the site during 1998 indicated habitat quality to be *good* and the macroinvertebrate community to be in *fair* condition (ADEM 1999g). Water

chemistry samples collected nine times from August 1998 through September 1999 showed elevated concentrations of nitrate/nitrite as compared to reference streams in the region (Appendix F-6c).

NPS Priority Status: Lower East Fork Choctawhatchee sub-watershed was identified as a priority sub-watershed due to biological and chemical conditions within the watershed (Table 14c).

Sub-Watershed: Blackwood Creek	**NRCS Sub-Watershed Number 030**

Land use: The Blackwood Creek sub-watershed drains approximately 44 mi^2 in Dale and Henry Counties. SWCD estimated land use in this sub-watershed as 38% row crops, 35% forest, 17% pasture, and 7% urban (Table 2c). One current construction/stormwater authorization and two industrial NPDES permits have been issued in the sub-watershed (Table 9c).

NPS impairment potential: The main NPS concerns within the sub-watershed were animal husbandry, sedimentation, and runoff from cropland and pastures (Table 5c). The overall potential for impairment from nonpoint sources was estimated as *moderate* (Table 5c). There was a *moderate* potential for impairment from urban runoff (Table 5c).

Assessments: No assessments have been conducted in this sub-watershed.

Sub-Watershed: Kelly Creek	**NRCS Sub-Watershed Number 040**

Land use: The Kelly Creek sub-watershed drains approximately 22 mi^2 in Dale County. SWCD estimated land as 39% row crops, 38% forest, 13% pasture, and 5% urban (Table 2c). Four current construction/stormwater authorizations and 1 mining NPDES permit have been issued in the sub-watershed (Table 9c).

***NPS impairment potential*:** The overall potential for NPS impairment was estimated as *moderate*. The main source of impairment was runoff from cropland and pastures (Table 5c). There was a *moderate* potential for impairment from urban runoff and development (Table 5c).

Assessments: No assessments have been conducted in this sub-watershed.

Sub-Watershed: Upper West Fork Choctawhatchee	**NRCS Sub-Watershed Number 050**

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
BSPB001	H, M,F,C	1998	Blue Spring in Blue Spring State Park		F&W
TSCP-12	C	1994-1996	West Fork Choctawhatchee @ HWY 10	87	F&W
WCHB001	H, M,F,C	1998	West Fork Choctawhatchee us of Blue Spring	86	F&W
WCHB002	H, M,F,C	1998	West Fork Choctawhatchee ds of Blue Spring	88	F&W

Land use: The Upper West Fork Choctawhatchee sub-watershed drains approximately 142 mi^2 in Barbour and Dale Counties. The primary land uses were forest, row crops, and pasture (Table 2c). Two current construction/stormwater authorizations and 1 industrial NPDES permit have been issued in the sub-watershed (Table 9c).

NPS impairment potential: Potential impairment from animal husbandry, aquaculture, and runoff from cropland and pasture were concerns within the sub-watershed. The overall potential for impairment from nonpoint sources was estimated as *moderate* (Table 5c).

Assessments: One stream reach was evaluated by the Center for Environmental Research and Service, Troy State University in 1994-1996 (Appendix F-4c). Three stream reaches were sampled in 1998 while assessing the water quality within Alabama's State Parks (Appendix F-3c)

Sub-Watershed: Bear Creek	**NRCS Sub-Watershed Number 060**

Land use: The Bear Creek sub-watershed drains approximately 35 mi^2 in Barbour, Dale, and Henry Counties. SWCD estimated land use was 70% forest, 18% row crops, and 10% pasture (Table 2c). One current construction/stormwater authorization has been issued in the sub-watershed (Table 9c).

NPS impairment potential: The local SWCD estimates of animal concentrations indicated a *moderate* impairment potential (Table 3c). Runoff from cropland and pasture was also a concern within the sub-watershed (Table 5c). The overall potential for impairment from nonpoint sources was estimated as *low* (Table 5c).

Assessments: No assessments have been conducted in this sub-watershed.

Sub-Watershed: Lower West Fork Choctawhatchee	**NRCS Sub-Watershed Number 070**

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
CW03U3-10	H,C	1999	W.Fork Choctawhatchee ¼ mile west of Dale Co. Rd. 59	210	F&W
CW1A4-13	H,C	2000	Unnamed tributary West Fork Choctawhatchee	1-2	F&W
TSCP-13	C	1994-1996	W. Fork Choctawhatchee @ Dale Co. Rd. 36	208	F&W
BGCD-1	C, H, M, F	1999	Big Creek @ Dale Co. Rd. 59	8	F&W
MECD-1	C, H, M	1999	Middle Creek @ Dale Co. Rd. 59	4	F&W
WTCD-1	C, H, M, F	1999	Walnut Creek @ Dale Co. Rd. 67	4	F&W

Land use: The Lower West Fork Choctawhatchee sub-watershed drains approximately 62 mi^2 in Dale County. SWCD estimated land use as 44% forest, 27% pasture, and 27% row crops (Table 2c). One construction/stormwater authorization and 1 municipal NPDES permit have been issued in the sub-watershed (Table 9c).

NPS impairment potential: The potential for impairment from activities associated with animal husbandry and runoff from pastures was estimated as *high* (Table 5c). The potential for impairment from cropland and aquaculture sources was *moderate* (Table 5c). The overall potential for impairment was estimated as *high* (Table 5c).

Assessments: Three stream reaches were assessed as part of the SE Alabama basins screening assessments. One stream reach was evaluated in 1994-1996 by the Center for Environmental Research and Service, Troy State University (Appendix F-4c). In 1999, 1 stream reach was evaluated as part of ADEM's ALAMAP program (Appendices F-8c, F-9c). During the 1999 NPS Screening Assessment three stream segments were selected for monitoring.

Big Creek: Habitat and aquatic macroinvertebrate community assessments were conducted in May 1999. Water chemistry and fish community assessments were conducted in July 1999. The stream reach evaluation indicated an *excellent* habitat for biological communities, however both the macroinvertebrate and fish communities were assessed as *fair* (Table 13c). The BGCD-1 sampling reach, had a mostly shaded canopy and was dominated by sand (~80%) with lesser amounts of detritus (~15%), silt (~2%) and clay (~1%) substrates (Table 6c). Habitat quality was assessed as *excellent* using the glide/pool assessment matrix (Table 6c). Five EPT families were collected indicating a *fair* aquatic macroinvertebrate community (Table 7c). The fish community sample indicated a *fair* fish community (Table 7c). The water samples collected in July 1999 did not indicate a cause of the moderate impairment to the biological communities.

Middle Creek: Habitat and aquatic macroinvertebrate community assessments were conducted at MECD-1 in May 1999. MECD-1 sampling reach had a partly-open/partly-shaded canopy and was dominated by sand (~76%) with lesser amounts of detritus (~20%), boulder (~2%), silt (~1%) and cobble (~1%) substrates (Table 6c). Habitat quality was assessed as *excellent* using the glide/pool assessment matrix (Table 6c). Six EPT families were collected indicating a *fair* aquatic macroinvertebrate community (Table 7c).

Walnut Creek: Habitat and aquatic macroinvertebrate community assessments were conducted in May 1999. Water chemistry and fish community assessments were conducted in July 1999. The WTCD-1 sampling reach, had a shaded canopy and was dominated by sand (~92%) with lesser amounts of detritus (~6%), clay (~2%) and silt (~1%) substrates (Table 6c). Habitat quality was assessed as *good* using the glide/pool assessment matrix (Table 6c). Nine EPT families were collected indicating a *fair* aquatic macroinvertebrate community (Table 7c). The fish sample collected indicated a *fair* fish community (Table 7c). Water chemistry samples collected in July 1999 indicated elevated nutrient concentrations as compared to reference streams in the region (Appendix D-1c, D-2c, F-1c, F-2c).

NPS Priority Status: Lower West Fork Choctawhatchee River was identified as a priority sub-watershed due to biological and chemical conditions within the watershed (Table 14c). Suspected causes are unknown; however, potential impairment from animal production operations and mining was estimated as moderate to high.

Sub-Watershed: Upper Judy Creek	**NRCS Sub-Watershed Number 080**

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
CW02U2-26	H,C	1998	Judy Creek 7.5 miles upstream of Little Judy Creek		F&W
CW03U2-34	H,C	1998	Judy Creek 1.5 miles upstream of Little Judy Creek		F&W
BLCD-1	C, H, M, F	1999	Blacks Creek @ unnamed Dale Co. Rd. off Co. Rd. 19	8	F&W
JDYD-2	C, H, M, F	1999	Judy Creek @ Dale Co. Rd. 15	51	F&W

Land use: The Upper Judy Creek sub-watershed drains approximately 51 mi^2 in Barbour, and Dale Counties. SWCD estimated land use as 69% forest, 10% pasture, 19% row crops (Table

2c). Two current construction/stormwater authorizations and 1 mining NPDES permit have been issued in the sub-watershed (Table 9c).

NPS impairment potential: The local SWCD estimates of animal concentrations and aquaculture land use indicated *high* impairment potentials (Table 5c). The potential for impairment from cropland and pasture runoff was *moderate* (Table 5c). The overall potential for impairment from nonpoint sources was estimated as *moderate* (Table 5c).

Assessments: In 1998, 2 stream reaches were evaluated as part of ADEM's ALAMAP program (Appendix F-8c, F-9c) and 2 stream were selected for monitoring during the NPS assessment.

Blacks Creek: Habitat, aquatic biological communities (macroinvertebrates and fish), and water chemistry assessments were conducted at BLCD-1 in 1999. The BLCD-1 sampling reach, had a shaded canopy and was dominated by sand (~92%) with lesser amounts of detritus (~5%), clay (~1%) and silt (~2%) substrates (Table 6c). Habitat quality was assessed as *excellent* using the glide/pool assessment matrix (Table 6c). Four EPT families were collected indicating a *poor* aquatic macroinvertebrate community (Table 7c). Fish collected within the stream reach indicated a *fair* fish community (Table 7c). Water samples collected in July 1999 did not indicate a water chemistry problem (Appendix D-1c, D-2c).

Judy Creek: Habitat, aquatic biological communities (macroinvertebrates and fish), and water chemistry assessments were conducted at JDYD-2 in 1999. The JDYD-2 sampling reach, had a mostly-shaded canopy and was dominated by sand (~78%) with lesser amounts of detritus (~20%), and silt (~2%) substrates (Table 6c). Habitat quality was assessed as *excellent* using the glide/pool assessment matrix (Table 6c). Eight EPT families were collected indicating a *fair* aquatic macroinvertebrate community; however, the fish collected indicated the sampling reach to have a *poor-fair* fish community (Table 7c). Water chemistry samples collected in July 1999 indicate organic and nutrient enrichment (Appendix D-1c, D-2c).

NPS Priority Status:

Upper Judy Creek was identified as a priority sub-watershed due to biological conditions within the watershed (Table 14c). Both stations assessed during the NPS screening assessments indicated either the fish or macroinvertebrate communities were severely impaired. Potential causes of impairment are runoff from animal production and mining operations.

Sub-Watershed: Little Judy Creek	**NRCS Sub-Watershed Number 090**

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
CW4U4-38	H,C	2000	Little Judy Creek	27	F&W

Land use: The Little Judy Creek sub-watershed drains approximately 30 mi^2 in Barbour and Dale Counties. SWCD estimated land use as 62% forest, 27% row crops, and 8% pasture (Table 2c). There are 2 current construction/stormwater authorizations in the sub-watershed (Table 9c).

NPS impairment potential: SWCD estimates of animal concentrations and aquaculture land use indicated *high* impairment potentials (Table 3c). Runoff from croplands was also a concern (Table 5c). The overall potential for NPS impairment was estimated as *moderate* (Table 5c).

Assessments: In 2000, one stream segment was evaluated as part of ADEM's ALAMAP program.

Sub-Watershed: Lower Judy Creek	NRCS Sub-Watershed Number 100

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
JDYD-1	C, H, M, F	1998, 1999	Judy Creek @ Al Hwy 105	90	F&W

Land Use: The Lower Judy Creek sub-watershed drains approximately 35 mi^2 in Dale County. Land use was estimated as 37% forest, 27% row crops, 21% urban, 12% pasture (Table 2c). There are no NPDES permits or current construction/stormwater authorizations issued in the sub-watershed (Table 9c).

NPS impairment potentials: The primary NPS concerns within the sub-watershed were animal husbandry, aquaculture, and runoff from pasture and croplands (Table 5c). The overall potential for impairment from nonpoint sources was estimated as *moderate* (Table 5c). The potential for impairment from urban runoff was estimated as *high* (Table 5c).

Assessments: One stream reach was assessed within the sub-watershed as part of the Southeast Alabama Poultry Industry Impact Study. This stream was one of eight that were monitored from August 1998 through September 1999.

Judy Creek: Habitat and aquatic macroinvertebrate community assessments were conducted at JDYD-1 in 1998 and 1999. A fish community assessment was conducted in 1999. The habitat was evaluated as *good* and *excellent* 1998 and 1999, respectively (Table 6c). The aquatic macroinvertebrate assessments indicated a *poor* community in both 1998 and 1999. The fish sample collected in 1999 indicated a *poor-fair* fish community. Water chemistry samples were collected 9 different times from August 1998 through September 1999. Overall water quality data collected from 1998-99 indicated elevated nutrient concentrations compared to reference sites within the region (Appendix F-6C).

NPS Priority Status: Lower Judy Creek was identified as a priority sub-watershed due to biological and chemical conditions within the watershed (Table 14c).

Sub-Watershed: Sconyers Branch	NRCS Sub-Watershed Number 110

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
CHO08	C	1996	Choctawhatchee River @ Al HWY 12	917	F&W
NCH (AU002)	C	1999	N. Fork Choctawhatchee River @ AL HWY 123	686	F&W
TSCP-14	C	1994-1996	Choctawhatchee River @ Waterford Rec Area	686	F&W

Land use: The Sconyers Branch sub-watershed drains approximately 75 mi^2 in Dale and Geneva Counties. SWCD estimates indicated forest, urban areas, row crops, and pasture to be the primary land uses within the sub-watershed (Table 2c). Three current construction/stormwater authorizations, 2 mining-, 2 municipal-, and 3 industrial- NPDES permits have been issued in the sub-watershed (Table 9c).

NPS impairment potential: The local SWCD estimates of animal concentrations and aquaculture land use indicated *moderate* impairment potentials (Table 3c). The potential for impairment caused by pasture runoff was also estimated as *moderate* (Table 5c). The overall potential for impairment from nonpoint sources was estimated as *low* (Table 5c). Impairment from urban sources was also a concern (Table 5c).

Assessments: One stream reach was evaluated in 1994-1996 by the Center for Environmental Research and Service, Troy State University (Table 8c and Appendix F-4c). In 1996 one stream reach was evaluated as part of ADEM's CWS sampling efforts (Appendix F-10c). A segment of Hurricane Creek is listed on ADEM's 1998 §303(d) list. The stream listed "cause of impairment" is pathogens (Table 11c).

Sub-Watershed: Kilibrew Mill Creek	**NRCS Sub-Watershed Number 120**

Land use: The Kilibrew Mill Creek sub-watershed drains approximately 16 mi^2 in Dale County. SWCD estimated land use as 54% forest, 26% row crops, 17% pasture, and 2% urban (Table 2c). Two municipal NPDES permits have been issued in the sub-watershed (Table 9c).

NPS Impairment: The local SWCD estimates of animal concentrations in the sub-watershed indicated a *high* impairment potential (Table 3c). Soil erosion estimates indicated a *moderate* potential for NPS impairment (Table 4c). Percent land use as pasture, crop, and aquaculture indicated *moderate* potential for impairment from these sources (Table 5c). The overall potential for impairment from nonpoint sources was estimated as *moderate* (Table 5c).

Assessments: No assessments were conducted in this sub-watershed.

Sub-Watershed: Little Choctawhatchee River	**NRCS Sub-Watershed Number 130**

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
CHO16	C	1996	Little Choctawhatchee River @ Dale Co. Rd. 9	116	F&W
CHO17	C	1996	Little Choctawhatchee River @ Dale AL HWY 92	160	F&W
CW02U1	H,C	1997	Sandy Branch 0.7 miles upstream of Hurricane Creek		F&W
TSCP-15	C	1994-1996	Little Choctawhatchee River @ Houston Co. Rd. 59	24	F&W
TSCP-16	C	1994-1996	Little Choctawhatchee River @ AL HWY 123	149	F&W
TSCP-17	C	1994-1996	Hurricane Creek @ Geneva Co. Rd. 41	50	
BRH-1	C, H, M	1999	Bear Creek @ unnamed Houston Co. Rd.	19	F&W
BVC-1	C	1999	Beaver Creek @ US Hwy 84	39	F&W
BVC-2	C, H., M.	1999	Beaver Creek @Houston Co. Rd. 59		F&W
BVC-3	C.	1999	Beaver Creek ¼ mile upstream of WWTP outfall	7	F&W
Beaver Creek WWTP outfall	C.	1999	Beaver Creek WWTP outfall	7	F&W

Land use: The Little Choctawhatchee River sub-watershed drains approximately 261 mi^2 in Dale, Geneva, Henry and Houston Counties. SWCD estimates indicated row crops, forest, and pasture to be the dominant land uses within the sub-watershed (Table 2c). There are 30 current

construction/stormwater authorizations, 6 mining, and 4 municipal-NPDES permits issued in the sub-watershed (Table 9c).

NPS impairment potential: Estimates of NPS impairment potential indicated animal husbandry, aquaculture, cropland, and pasture to be concerns within the sub-watershed (Table 5c). The overall potential for impairment from nonpoint sources was estimated as *moderate* (Table 5c). Impairment from urban runoff and development was estimated as *moderate* and *high*, respectively (Table 5c).

Assessments: Three stream reaches were evaluated 1994-1996 by the Center for Environmental Research and Service, Troy State University (Table 8c and Appendix F-4c). In 1996, 2 stream reaches were evaluated as part of ADEM's CWS sampling efforts (Appendix F-10c). In 1997, one stream reach was evaluated as part of ADEM's ALAMAP program (Appendix F-8c, F-9c). One macroinvertebrate assessment and 3 chemical assessments were conducted on streams within the sub-watershed under the 1999 §303(d) sampling conducted in conjunction with the NPS screening project. A segment of Dowling Branch is on Alabama's 1998 §303(d) list of impaired waterbodies (Table 11c). The listed cause of impairment was organic enrichment/DO and pathogens.

Bear Creek: The stream reach at BRH-1 has been sampled as an ecoregional reference site since 1991. As part of the NPS assessment conducted in Southeast Alabama, habitat and macroinvertebrate community assessments were conducted in May 1999. The sampling reach at BRH-1 was dominated by sand (65%) with lesser amounts of silt (15%), detritus (10%) and clay (1%). Habitat quality was assessed as *excellent* using the glide/pool assessment matrix (Table 6c). Six EPT families were collected indicating a *good* aquatic macroinvertebrate community (Table 7c).

Beaver Creek: Habitat and aquatic macroinvertebrate community assessments were conducted at BVC-2 in 1999 as part of §303(d) stream monitoring. The sampling reach was dominated by sand (91%) with lesser amounts of detritus (6%) and silt (2%) (Table 6c). Habitat quality, mainly influenced by bank vegetative stability and riparian measurements, was assessed as *excellent* using the glide/pool assessment matrix (Table 6c). Two EPT families were collected indicating a *poor* aquatic macroinvertebrate community (Table 7c).

NPS Priority Status: This sub-watershed was identified as a priority based on impaired biological conditions. This sub-watershed was monitored as part of the 303(d) sampling conducted 1999. The impairment may result from point and nonpoint sources (Table 14c).

Sub-Watershed: Upper Clay Bank Creek	**NRCS Sub-Watershed Number 140**

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
TSCP-10	C	1994-1996	Pea River @ AL HWY 27	1552	F&W
TSCP-18	C	1994-1996	Little Claybank Creek @ HWY 231		F&W
TSCP-25	C	1994-1996	Claybank Creek @ Dale Co. Rd. 36	13	F&W

Land use: The Upper Clay Bank Creek sub-watershed drains approximately 84 mi^2 in Coffee and Dale Counties. SWCD estimated land use as 55% forest, 15% row crops, 7% pasture, and 20%

other land uses (Table 2c). Eight current construction/stormwater authorizations and two industrial NPDES permits have been issued in the sub-watershed (Table 9c).

NPS impairment potential: Potential for NPS impairment estimated from animal concentrations was *high*. The potential for impairment from aquaculture was estimated as *moderate*. The overall potential for impairment from nonpoint sources was estimated as *moderate* (Table 5c). The potential for impairment from urban development was estimated as *high* (Table 5c).

Assessments: Three stream reaches were evaluated by the Center for Environmental Research and Service, Troy State University from 1994-1996 (Appendix F-4c).

Sub-Watershed: Steep Head Creek	**NRCS Sub-Watershed Number 150**

Land use: The Steep Head Creek sub-watershed drains approximately 64 mi^2 in Coffee, and Dale Counties. According to SWCD land use estimates, this sub-watershed is predominantly forest (85%) with some row crops (6%), urban areas (5%), and pasture (4%) (Table 2c). Three current construction/stormwater authorizations have been issued in the sub-watershed (Table 9c). A four-mile segment of an unnamed tributary of Harrand Creek has been list on Alabama's 1998 §303(d) list of impaired waterbodies due to nutrient and organic enrichment (Table 11c).

NPS Impairment: Potential for NPS impairment from silviculture was *moderate* (Table 5c). The overall potential for impairment from nonpoint sources was estimated as *low* (Table 5c). The potential for impairment from urban runoff and development was moderate (Table 5c).

Assessments: No assessments have been conducted in this sub-watershed.

Sub-Watershed: Lower Clay Bank Creek	**NRCS Sub-Watershed Number 160**

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
CHO01	C	1996	Claybank Creek @ AL HWY 248	195	F&W
CHO02	C	1996	Claybank Creek @ Dale Co. Rd. 24	205	F&W
TSCP-19	C	1994-1996	Claybank Creek @ Hwy134	200	F&W

Land use: The Lower Clay Bank Creek sub-watershed drains approximately 42 mi^2 in Coffee, Dale and Geneva Counties. Land use was a mixture of cropland, urban areas, forest, and pasture (Table 2c). Two current construction/stormwater authorizations, 1 municipal, and 2 industrial NPDES permits have been issued in the sub-watershed (Table 9c).

NPS impairment potential: Aquaculture and runoff from pasture and cropland were the main NPS concerns within the sub-watershed (Table 5c). The overall potential for impairment from nonpoint sources was estimated as *moderate* (Table 5c). The potential for impairment from urban runoff was estimated as *high* (Table 5c).

Assessments: One stream reach was evaluated by the Center for Environmental Research and Service, Troy State University from 1994-1996 (Appendix F-4c). Two stream segments were sampled in 1996 as part ADEM's CWS sampling efforts (Appendix F-10c).

Sub-Watershed: Harrand Creek	NRCS Sub-Watershed Number 170

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
HCWW001	C	1999	Harrand Creek WWTP Outfall		
HDC-1	Habitat, Macroinv.	1999	Harrand Creek @ Lowe Field	20	F & W
HDC-2	Habitat, Macroinv.	1999	Harrand Creek @ Coffee Co. Rd. 702	7	F & W
UTHC-1	Habitat, Macroinv.	1999	Unnamed tributary of Harrand Creek @ Dixie Dr	5	F & W

Land use: The Harrand Creek sub-watershed drains approximately 20 mi^2 in Coffee and Dale Counties. This sub-watershed is primarily urban and forest (Table 2c). Twelve current construction/stormwater authorizations, 1 mining and 1 municipal NPDES permits have been issued in the sub-watershed (Table 9c).

NPS impairment potential: Soil erosion estimates indicated a *moderate* potential for NPS impairment (Table 4c). The potential for impairment from all other rural NPS categories was estimated as *low* (Table 5c).

Assessments: Harrand Creek had three monitoring stations and an unnamed tributary of Harrand Creek had one monitoring station sampled in 1999 in conjunction with the §303(d) stream assessments.

Harrand Creek: Habitat and aquatic macroinvertebrate community assessments were conducted at two locations on Harrand Creek in 1999. The sampling reach at HDC-1 was dominated by sand (88%) with lesser amounts of detritus (6%), silt (2%), gravel (2%) and clay (2%). Habitat quality was assessed as *excellent* using the glide/pool assessment matrix (Table 6c). Seven EPT families were collected indicating a *fair* aquatic macroinvertebrate community (Table 7c). The sampling reach at HDC-2 was dominated by sand (45%) with lesser amounts of clay (30%), detritus (12%) and silt (12%). Habitat quality was assessed as *excellent* using the glide/pool assessment matrix (Table 6c). Four EPT families were collected indicating a *poor* aquatic macroinvertebrate community (Table 7c).

NPS Priority Status: This sub-watershed was identified as a priority based on impaired biological conditions. This sub-watershed was monitored as part of the 303(d) sampling conducted 1999. The impairment may result from point and nonpoint sources (Table 14c).

Sub-Watershed: Cowpen Creek	NRCS Sub-Watershed Number 180

Land use: The Cowpen Creek sub-watershed drains approximately 14 mi^2 in Coffee, and Dale, Counties. SWCD estimated land use as 45% row crops, 40% urban, 10% forest, and 5% pasture (Table 2c). There are 2 current construction/stormwater authorizations and 1 municipal NPDES permit issued in the sub-watershed (Table 9c).

NPS impairment potentials: The potential for impairment from soil erosion and runoff from cropland was estimated as *moderate* (Table 5c). The overall potential for impairment from nonpoint sources was estimated as *moderate* (Table 5c). There was a high potential for impairment from urban runoff (Table 5c).

Assessments: No assessments have been conducted in this sub-watershed.

Sub-Watershed: Line Creek	**NRCS Sub-Watershed Number 190**

Land use: The Line Creek sub-watershed drains approximately 8 mi^2 in Coffee, and Dale, Counties. SWCD estimates indicated the sub-watershed to be a mixture of forest, row crops, pasture, and urban areas (Table 2c). One current construction/stormwater authorization has been issued in the sub-watershed (Table 9c).

NPS impairment potentials: The overall potential for impairment from nonpoint sources was estimated as *high* sources (Table 5c). The local SWCD estimates of animal concentrations indicated a *high* impairment potential (Table 3c). Potential for NPS impairment from pasture and aquaculture was *high* (Table 5c). Estimates of sedimentation and percent cropland land use indicated moderate potentials for impairment (Table 5c). There was a high potential for impairment from urban runoff.

Assessments: No assessments have been conducted in this sub-watershed.

Sub-Watershed: Brackins Mill Creek	**NRCS Sub-Watershed Number 200**

Land use: The Brackins Mill Creek sub-watershed drains approximately 5 mi^2 in Coffee and Dale Counties. No SWCD land use estimates were available for this sub-watershed. However, EPA estimated land use to be 59% cropland, 25% forest, 6and 15% (Table 2c). One current construction/stormwater authorization has been issued in the sub-watershed (Table 9c).

NPS impairment potential: No SWCD worksheets were completed on this sub-watershed.

Assessments: No assessments were conducted in this sub-watershed.

Sub-Watershed: Wilkerson Creek	**NRCS Sub-Watershed Number 210**

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
CHO09	C	1996	Choctawhatchee River @ Geneva Co. Rd. 45	1240	F&W
TSCP-47	C	1994-1996	Wilkerson Creek @ Coffee Co. Rd. 723	10	F&W
TSCP-48	C	1994-1996	Wilson Creek @ Coffee Co. Rd. 719	4	F&W

Land use: The Wilkerson Creek sub-watershed drains approximately 36 mi^2 in Coffee, Dale, and Geneva Counties. SWCD estimated land use in this sub-watershed as 60% row crops, 19% forest, 16% pasture, and 4% urban (Table 2c). There are four current construction/stormwater authorizations issued in the sub-watershed (Table 9c).

NPS impairment potential: The primary NPS concerns within the sub-watershed were estimated to be animal husbandry, runoff from pasture and cropland, and sedimentation (Table 5c). The overall potential for impairment from nonpoint sources was estimated as *moderate* (Table 5c).

The potential for impairment from urban runoff and development was estimated as *moderate* (Table 5c).

Assessments: This sub-watershed was not selected for evaluation during the NPS screening assessments; however, three stream segments have been assessed within the Wilkerson Creek sub-watershed in the recent past. Two stream reaches were evaluated by the Center for Environmental Research and Service, Troy State University from 1994-1996 (Appendix F-4c). One stream reach was sampled in 1996 as part ADEM's CWS sampling efforts (Appendix F-10c).

Sub-Watershed: Choctawhatchee River	**NRCS Sub-Watershed Number 220**

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
TSCP-20	C	1994-1996	Choctawhatchee River @ HWY 52	1346	F&W
TSCP-38	C	1994-1996	Providence Creek @ HWY 85	11	F&W
ASCG-1	C, H, M	1999	Adams Creek @ Al Hwy 85	8	F&W
CMCG-1	C, H, M	1999	Campbell Mill Creek @ Al Hwy 85	7	F&W

Land use: The Choctawhatchee River sub-watershed drains approximately 50 mi^2 in Coffee and Geneva Counties. SWCD estimated land use in this sub-watershed as 45% row crops, 34% forest, and 15% pasture (Table 2c). Three current construction/stormwater authorizations and 1mining NPDES permit have been issued in the sub-watershed (Table 9c).

NPS impairment potential: The overall potential for impairment from nonpoint sources was estimated as *high* (Table 5c). The potential for impairment from cropland runoff was estimated as *high* (Table 5c). There was a moderate potential for impairment from several NPS categories, including animal husbandry, aquaculture, pasture runoff, forestry activities, and sedimentation (Table 5c). The potential for impairment from urban development was estimated as moderate (Table 5c).

Assessments: Two stream reaches were evaluated by the Center for Environmental Research and Service, Troy State University from 1994-1996 (Table 8c and Appendix F-4c) and two streams were selected and sampled during the SE AL basins NPS screening assessments.

Adams Creek: Habitat and aquatic macroinvertebrate community assessments were conducted at ASCG-1 in 1999. The ASCG-1 sampling reach, had a mostly-shaded canopy and was dominated by sand (~90%) with lesser amounts of detritus (~7%), clay (~2%) and silt (~1%) substrates (Table 6c). Habitat quality was assessed as *good* using the glide/pool assessment matrix (Table 6c). Four EPT families were collected indicating a *fair* aquatic macroinvertebrate community (Table 7c).

Campbell Mill Creek: Habitat and aquatic macroinvertebrate community assessments were conducted at CMCG-1 in May 1999. The CMCG-1 sampling reach, had a mostly-shaded canopy and was dominated by sand (~85%) with lesser amounts of detritus (~10%), silt (~3%) and clay (~1%) substrates (Table 6c). Habitat quality was assessed as *excellent* using the glide/pool assessment matrix (Table 6c). Seven EPT families were collected indicating a *good* aquatic macroinvertebrate community (Table 7c).

NPS Priority Status: The Choctawhatchee River sub-watershed was identified as a priority sub-watershed due to moderate impaired biological conditions and high potential for NPS impairment within the watershed (Table 14c).

Sub-Watershed: Upper Double Bridges Creek	**NRCS Sub-Watershed Number 230**

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
CHO03	C	1996	Blanket Creek @ Coffee Co. Rd. 622	12	F&W
CHO04	C	1996	Double Bridges Creek @ Coffee Co. Rd. 655	45	F&W
TSDB-1	C	1994-1995	Double Bridges Creek @ Coffee Co. Rd. 537	18	F&W
TSDB-10	C	1994-1995	Little Double Bridges Creek @ HWY 134	8	F&W
TSDB-11	C	1994-1995	Little Double Bridges Creek @ Coffee Co. Rd. 606	15	F&W
TSDB-12	C	1994-1995	Little Double Bridges Creek @ Coffee Co. Rd. 636	24	F&W
TSDB-18	C	1994-1995	Unnamed tributary @ Coffee Co. 537	21	F&W
TSDB-2	C	1994-1995	Double Bridges Creek @ Coffee Co. Rd. 636	83	F&W
TSDB-3	C	1994-1995	Double Bridges Creek @ Coffee Co. Rd. 661	78	F&W
TSDB-4	C	1994-1995	Double Bridges Creek @ Geneva Co. Rd. 64	90	F&W
TSDB-8	C	1994-1995	Blanket Creek @ new bypass	4	F&W
TSDB-9	C	1994-1995	Little Double Bridges Creek @ Coffee Co. Rd. 531	3	F&W

Land use: The Upper Double Bridges Creek sub-watershed drains approximately 94 mi^2 in Coffee and Geneva Counties. SWCD estimated land use in this sub-watershed as 50% forest, 33% row crops, 12% pasture, and 4% urban (Table 2c). Five current construction/stormwater authorizations, 2 municipal-, and 1 industrial-NPDES permits have been issued in the sub-watershed (Table 9c).

NPS impairment potential: The potential for impairment caused by runoff from pasture and croplands was estimated as *moderate*. The local SWCD estimates of animal concentrations and soil erosion rates indicated *moderate* impairment potentials (Table 5c). The overall potential for impairment from nonpoint sources was estimated as *moderate* (Table 5c). The potential for impairment from urban runoff and development was also estimated as moderate (Table 5c).

Assessments: Two stream segments were sampled in 1996 as part of ADEM's 1996 CWS sampling efforts (Appendix F-10c). Ten stream segments were sampled in 1994-1995 by the Center for Environmental Research and Service, Troy State University (Appendix F-4c).

Sub-Watershed: Tight Eye Creek	NRCS Sub-Watershed Number 240

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
TSDB-13	C	1994-1995	Tight Eye Creek @ Coffee Co. Rd. 636	10	F&W
TSDB-14	C	1994-1995	Tight Eye Creek @ Geneva Co. Rd. 661	14	F&W
TSDB-15	C	1994-1995	Tight Eye Creek @ Geneva Co. Rd. 79		F&W
TECC-2	C, H, M	1999	Tight Eye Creek @ Coffee Co. Rd. 661	14	F&W

Land use: The Tight Eye Creek sub-watershed drains approximately 43 mi^2 in Coffee and Geneva Counties. SWCD estimated land use in this sub-watershed as 46% forest, 36% row crops, and 13% pasture (Table 2c). Two current construction/stormwater authorizations have been issued in the sub-watershed (Table 9c).

NPS impairment potential: The overall potential for impairment from nonpoint sources (Table 5c) was estimated as *moderate*. Nonpoint source concerns within the sub-watershed included aquaculture, sivliculture, cropland, pasture, and sedimentation (Table 5c).

Assessments: Three stream segments were sampled by the Center for Environmental Research and Service, Troy State University in 1994 - 1996 (Table 8c and Appendix F-4c). One stream segment was sampled while assessing Tight Eye Creek sub-watershed for NPS impairment.

Tight Eye Creek: Habitat and macroinvertebrate community assessments were conducted at TECC-2 in May 1999. The TECC-2 sampling reach, had a shaded canopy and was dominated by sand (~60%) with lesser amounts of detritus (~18%), clay (~1%) and organic silt (~21%) substrates (Table 6c). Habitat quality was assessed as *excellent* using the glide/pool assessment matrix (Table 6c). Nine EPT families were collected indicating a *good* aquatic macroinvertebrate community (Table 7c).

Sub-Watershed: Lower Double Bridges Creek	NRCS Sub-Watershed Number 250

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
TSDB-16	C	1994-1995	Little Beaverdam Creek @ Geneva Co. Rd. 75	5	F&W
TSDB-17	C	1994-1995	Beaverdam Creek @ Geneva Co. Rd. east of Spears	21	F&W
TSDB-5	C	1994-1995	Double Bridges Creek @ unnamed Geneva Co. Rd. east of Spears	138	F&W
TSDB-6	C	1994-1995	Double Bridges Creek @ Geneva Co. Rd. 58	143	F&W
TSDB-7	C	1994-1995	Double Bridges Creek @ Geneva Co. Rd. 65	175	F&W
CHO05	C	1996	Double Bridges Creek @ Geneva Co. Rd. 65	175	F&W

Land use: The Lower Double Bridges Creek sub-watershed drains approximately 56 mi^2 in Coffee and Geneva Counties. SWCD estimated land use in this sub-watershed as 48% row crops,

37% forest, and 14% pasture (Table 2c). Two current construction/stormwater authorizations have been issued in the sub-watershed (Table 9c).

NPS impairment potential: The local SWCD estimates aquaculture and row crop land uses indicated *high* potentials for NPS impairment (Table 5c). There was a *moderate* potential for impairment from animal husbandry and silvicultural areas. Potential impairment from pasture runoff was *moderate*. Soil erosion estimates indicated a *moderate* potential for NPS impairment (Table 4c). Potential for NPS impairment from forestry was *moderate* (Table 5c). The overall potential for impairment from nonpoint sources was estimated as *high* (Table 5c).

Assessments: Five stream segments were sampled by the Center for Environmental Research and Service, Troy State University in 1994 - 1995 (Appendix F-4c). One stream segment was sampled in 1996 during the CWS effort.

Pea River CU (0314-0202)

Land use: The primary land-uses throughout the Pea River cataloging unit were forestland and cropland (Table 12b). It contains 13 sub-watersheds located within Bullock, Barbour, Coffee, Covington, Crenshaw, Dale, Geneva, and Pike Counties (Fig 3c). The CU is located in the Southeastern Plains Ecoregion (Subecoregions 65d, 65f and 65g) and drains Coastal Plain soils (NRCS 1997). Two sub-watersheds contain segments on Alabama's 1998 §303(d) list of impaired waterbodies (Table 11c).

Percent land cover estimated by local SWCD (ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
62%	21%	12%	0%	2%	1%	1%

NPS impairment potential: Eleven sub-watersheds were estimated to have a *moderate* to *high* potential for impairment from nonpoint sources. The main NPS concerns were runoff from animal production operations, pasture and row crops. Impairment from urban and development runoff was estimated a *moderate* concern within 11 sub-watersheds and *high* in one sub-watershed (Table 5c).

Number of sub-watersheds with (M)oderate or (H)igh ratings for each NPS category (Table 5a).

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Moderate	3	10	4	10	8	1	8	8
High	8	1	3	1	2	4	0	2

Number of sub-watersheds with (M)oderate or (H)igh ratings for each point source category (Table 5a).

Category	% Urban	Development	Septic tank failure
Moderate	2	9	0
High	0	1	0

Historical data/studies: Water quality assessments have been conducted recently within 11 of the 13 sub-watersheds within the cataloging unit (Table 8c). The majority of assessments were from studies conducted by ADEM, and Troy State University. In 1996, ADEM monitored 6 stations associated with its Clean Water Strategy (CWS) sampling efforts (Appendix F-10c). Six sites were evaluated in conjunction with ADEM's ALAMAP Program (Appendix F-8c, F-9c) (ADEM 2000b). Four of the eight streams monitored in 1998 and 1999 in association with the Southeast Alabama Poultry Industry Impact Study are located in the Pea River CU. The Center for Environmental Research and Service at Troy State University monitored 30 locations within the Pea River CU (Appendix F-4c). A summary of each of these studies, including lead agency, project objectives, data collected, and applicable quality assurance manuals is provided with the appropriate appendices.

Assessments conducted: Table 10c lists the stations assessed in conjunction with the Southeast NPS Screening Assessment. Eight stations located within the Pea River (010), Whitewater Creek (070), Flat Creek (110), and Pea River (140) sub-watersheds were assessed. Results of habitat and biolgical assessments are presented in Tables 6c and 7c, respectively. Chemical/physical data are provided in Appendices D-1a and D-2a.

Sub-watershed summaries: Current and historical monitoring data were used to provide a comprehensive assessment. A summary of the information available for both sub-watersheds is provided. Each summary discusses land use, NPS impairment potential, assessments conducted within the sub-watershed, and NPS priority rating based on available data. The summaries point out significant data and reference appropriate tables and appendices. Assessment of habitat, biological, and chemical conditions is based on long-term data from ADEM's Ecoregional Reference Site Program.

Sub-watershed assessments: Habitat, chemical/physical, and biological indicators of water quality were monitored at 15 stations located within 8 sub-watersheds (Table 13c). Habitat quality was generally assessed as *excellent* (Table 6c). Results of the macroinvertebrate assessments indicated the macroinvertebrate community to be in *good* condition at 8 (53%) stations, *fair* condition at 6 (40%) and *poor* at 1 station (6%) (Table 7c). Fish community assessments were conducted at 5 of these stations (Table 7c). Results indicated the fish community to be in *fair* condition at 3 (60%) stations, and *poor* at 2 (40%) stations.

The overall condition for each station was rated as the lowest assessment result obtained (Table 13c). Seven stations were assessed as *good,* 6 stations were assessed as *fair*, and 2 stations were assessed *poor*.

NPS priority sub-watersheds: A sub-watershed was recommended for NPS priority status if the macroinvertebrate or fish community was assessed as *fair* or *poor*. Bioassessment results indicated biological impairment to the macroinvertebrate and/or fish communities at 8 stations located within 6 sub-watersheds (Table 13c). These sub-watersheds were recommended for NPS priority status (Table 14c).

Sub-Watershed: Pea River	NRCS Sub-Watershed Number 010

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
CW01U2-23	H,C	1998	Double Creek 7.2 miles upstream of confluence with Pea River		F&W
DRYB001	H,M,F,C	1999	Dry Creek @ AL HWY 239	8	F&W
TSCP-1	C	1994-1996	Big Sandy Creek @ Bullock Co. Rd. 8	17	F&W
TSCP-2	C	1994-1996	Pea River @ Pike Co. Rd. 44	173	F&W
TSCP-27	C	1994	Conner's Creek @ Pike Co. Rd. 97	4	F&W
BSCB-1	C, H, M	1999	Big Sandy Creek @ Bullock Co. Rd. 8	17	F&W
JHCB-1	C, H, M	1999	Johnson Creek @ Bullock Co. Rd. 14	15	F&W

Land use: The Pea River sub-watershed drains approximately 194 mi^2 in Barbour, Bullock and Pike Counties. Land use within the sub-watershed is mainly forest (88%), mixed with some row crops (6%) and pasture (4%) (Table 2c). Three current construction/stormwater authorizations and 1 municipal NPDES permit have been issued in the sub-watershed (Table 9c).

NPS impairment potential: The potential for impairment from mining areas was *moderate* (Table 5c). The potential for impairment from other rural NPS categories was *low* (Table 5c). There was a *moderate* potential for impairment from urban development (Table 5c).

Assessments: Three stream segments were monitored by the Center for Environmental Research and Service at Troy State University (Appendix F-4c). In 1998, one stream segment was assessed using water quality parameters as part of the ADEM ALAMAP program (Appendix F-8c,). Two locations were selected for monitoring as part of the NPS screenings. One of the ecoregional reference sites is located within this sub-watershed and was monitored as part of the NPS assessment.

Big Sandy Creek: Habitat and aquatic macroinvertebrate assessments were conducted at BSCB-1 in 1999. The sampling reach had a mostly-shaded canopy and was dominated by sand (~92%) with lesser amounts of detritus (~7%) and silt (~1%) substrates (Table 6c). Habitat quality was assessed as *excellent* using the glide/pool assessment matrix (Table 6c). Six EPT families were collected indicating a *fair* aquatic macroinvertebrate community (Table 7c).

Johnson Creek: Habitat and aquatic macroinvertebrate assessments were conducted at JHCB-1 in 1999. The sampling reach had a partly-open/partly-shaded canopy and was dominated by sand (~90%) with less amounts of detritus (~7%) and silt (~1%) substrates (Table 6c). Habitat quality was assessed as *good* using the glide/pool assessment matrix (Table 6c). Seven EPT families were collected indicating a *fair* aquatic macroinvertebrate community (Table 7c).

Bear Creek: The stream reach at DRYB-1 has been sampled as an ecoregional reference site since 1991. As part of the NPS assessment conducted in Southeast Alabama, habitat and macroinvertebrate community assessments were conducted in June 1999. The sampling reach at DRYB-1 was dominated by sand (96%) with lesser amounts of silt (1%), detritus (2%) and gravel (1%). Habitat quality was assessed as *good* using the glide/pool assessment matrix (Table 6c). Four EPT families were collected indicating a *poor* aquatic macroinvertebrate community (Table 7c).

NPS Priority Status: The Pea River sub-watershed was identified as a priority sub-watershed because of biological conditions within the watershed (Table 14c). All three stream segments indicated impairment. At this time there is no indication of the cause of impaired biological conditions.

Sub-Watershed: Pea Creek	**NRCS Sub-Watershed Number 020**

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
CHO06	C	1996	Pea River @ AL HWY 130	299	F&W
TSCP-3	C	1994-1996	Stinking Creek @ AL HWY 239	13	F&W

Land use: The Pea Creek sub-watershed drains approximately 105 mi^2 in Barbour County. SWCD estimate land use as 65% forest, 20% row crops, and 12% pasture (Table 2c). There are 2 current construction/stormwater authorizations and 1 municipal NPDES permit issued in the sub-watershed (Table 9c).

NPS impairment potential: The overall potential for impairment from nonpoint sources was estimated as *moderate* (Table 5c). Livestock, aquaculture, pasture, and croplands were NPS concerns within the sub-watershed (Table 5c).

Assessments: Two stream segments were monitored previously within the sub-watershed. One stream by the Center for Environmental Research and Service, Troy State University (Appendix F-4c) and one stream segment was monitored by ADEM in 1996 as part of the CWS sampling efforts (Appendix F-10c).

Sub-Watershed: Buckhorn Creek	**NRCS Sub-Watershed Number 030**

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
TSCP-23	C	1994	Buckhorn Creek @ HWY 130	40	F&W
TSCP-24	C	1994	Buckhorn Creek @ pike Co. Rd.38	29	F&W
TSCP-39	C	1994	Richland Creek @ Pike Co, Rd. 81	28	F&W
TSCP-40	C	1994	Richland Creek @ HWY 10	35	F&W
TSCP-41	C	1994	Sandy Run Creek @ Pike Co. Rd.81	4	F&W
TSCP-42	C	1994	Sandy Run Creek @ HWY 10	6	F&W
PEAB-1	C, H, M	1998, 1999	Pea River @ Al Hwy 10	361	F&W

Land use: The Buckhorn Creek sub-watershed drains approximately 143 mi^2 in Barbour, Bullock, and Pike Counties. SWCD estimated land use as 64% forest, 17% pasture, and 17% row crops (Table 2c). Five current construction/stormwater authorizations and 1 municipal NPDES permit have been issued in the sub-watershed (Table 9c).

NPS impairment potential: The overall potential for impairment from nonpoint sources was estimated as *high* (Table 5c). The main NPS concerns within the sub-watershed were animal husbandry, aquaculture, cropland, pasture, and sedimentation (Table 5c). The potential for impairment from urban development was estimated as *moderate* (Table 5c).

Assessments: Six stream reaches were sampled in 1994 by Troy State Universities Center for Environmental Research and Service. One stream reach was assessed within the sub-watershed as part of the Southeast Alabama Poultry Industry Impact Study. Nine visits were made to the PEAB-1 stream reach over a thirteen-month period while collecting a baseline of data to better assess the potential of impact from the increased poultry activity in the region.

Pea River: Macroinvertebrate community assessments were conducted at PEAB-1 in 1998 and 1999. The stream reach was evaluated with a *good* and *fair* macroinvertebrate community in 1998 and 1999 respectively (Table 7c). Water chemistry samples were collected during nine visits from August 1998 through September 1999. Overall water quality data collected from 1998-99 indicated elevated concentrations of nutrients as compared to reference streams in the region (Appendices F-3 and F-6C).

NPS Priority Status: The Buckhorn Creek is recommended as a low priority sub-watershed (Table 14c). Monitoring of a stream segment of the Pea River indicated moderate impairment of biological conditions. Intensive chemical sampling showed fecal coliform and BOD concentrations to be periodically high and a potential source of the impairment (Appendix F-6c).

Sub-Watershed: Pea River	**NRCS Sub-Watershed Number 040**

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
PEA(AU001)	C	1999	Pea River @ US HWY 231	498	F&W
TSCP-22	C	1994	Bowden Mill Creek @ Pike Co. Rd. 73	16	F&W
TSCP-26	C	1994	Clearwater Creek @ Pike Co. Rd.59	2	F&W
TSCP-29	C	1994	Halls Creek @ Coffee Co. Rd. 114	11	F&W
TSCP-34	C	1994	Pea River @ Coffee Co. Rd 246	600	F&W
TSCP-35	C	1994	Pea River @ Coffee Co. Rd. 127	551	F&W
TSCP-36	C	1994	Pea River @ Coffee Co. Rd.107	541	F&W
TSCP-4	C	1994	Pea River @ US HWY 231	498	F&W
TSCP-5	C	1994	Pea River @ Coffee Co. Rd.147		F&W
CLWC-1	C, H, M, F	1998, 1999	Clearwater Creek at Coffee Co. Rd. 110	14	F&W

Land use: The Pea River sub-watershed drains approximately 199 mi^2 in Barbour, Coffee, Dale and Pike Counties. According to SWCD land use estimates, this sub-watershed supports mainly forest (70%), some row crops (16%), pasture (11%), and wetlands (1%) (Table 2c). Four current construction/stormwater authorizations and 1 industrial NPDES permit have been issued in the sub-watershed (Table 9c).

NPS impairment potential: The overall potential for impairment from nonpoint sources was estimated as *high* (Table 5c). Estimates of NPS impairment potential indicated animal husbandry, silviculture, aquaculture, cropland, pasture, and sedimentation to be NPS concerns within the sub-watershed (Table 5c). There was a *moderate* potential for impairment from urban development (Table 5c).

Assessments: Nine stream reaches were sampled in 1994 by Troy State Universities Center for Environmental Research and Service. One stream reach was assessed within the sub-watershed as part of the Southeast Alabama Poultry Industry Impact Study. Nine visits were made to the CLWC-1 stream reach over a thirteen-month period while collecting a baseline of data to better assess the potential of impact from the increased poultry activity in the region.

Clearwater Creek: Aquatic macroinvertebrate and fish community assessments were conducted at CLWC-1 in 1998 and 1999 respectively. The aquatic macroinvertebrates were not sampled in 1999 due to the disruption of the stream reach caused by construction work being performed on an old mill upstream. The stream reach had a *fair* aquatic macroinvertebrate community in 1998 and a *fair-good* fish community in 1999 (Table 7c). Water chemistry samples were collected nine different times from August 1998 through September 1999. Data indicated elevated nutrient concentrations (Appendix F-6C).

NPS Priority Status: Pea River was identified as a priority sub-watershed due to biological, and chemical conditions within the watershed (Table 14c). Intensive chemical sampling showed fecal coliform, NO_3+NO_2, and BOD concentrations to be periodically high and a potential source of the impairment (Appendix F-6c).

Sub-Watershed: Whitewater Creek	**NRCS Sub-Watershed Number 050**

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
CW01U1	H,C	1997	Unnamed tribuatry of Whitewater Creek 1.2 mile upstream of confluence with Whitewater Creek		F&W
CW02U3-26	H,C	1999	Whitewater Creek @ Pike Co. Rd. 65	22	F&W
TSCP-21	C	1994	Blue Spring @ Blue Spring State Park		F&W
TSCP-45	C	1994	Whitewater Creek @ Pike Co. Rd. 59	28	F&W
TSCP-46	C	1994	Whitewater Creek @ Pike Co. Rd. 26	9	F&W

Land use: The Whitewater Creek sub-watershed drains approximately 32 mi^2 in Pike County. Land use was estimated as 39% forest, 28% pasture, and 28% row crops (Table 2c). One current construction/stormwater authorization has been issued in the sub-watershed (Table 9c).

NPS impairment potential: The overall potential for impairment from nonpoint sources was estimated as *high* (Table 5c). The potential for impairment from livestock areas, pasture, mining, and sedimentation was estimated as high. There was a moderate potential for impairment from runoff from cropland and silvicultural areas (Table 5c).

Assessments: Three stream reaches were sampled in 1994 by Troy State Universities Center for Environmental Research and Service. In 1997 and 1999, stream segments were evaluated as part of ADEM's *ALAMAP* program (Appendices F-8c and F-9c).

Sub-Watershed: Walnut Creek	**NRCS Sub-Watershed Number 060**

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
CW01U3-52	H,C	1999	Tribuatry of Walnut Creek .5 mile east of Pike Co. Rd. 63	1-2	F&W
TSCP-43	C	1994	Walnut Creek @ Pike Co. Rd. 32	2	F&W
TSCP-44	C	1994	Walnut Creek @ US HWY 231	21	F&W
TSCP-6	C	1994	Walnut Creek @ Pike Co. Rd. 59	33	F&W

Land use: The Walnut Creek sub-watershed drains approximately 44 mi^2 in Pike County. According to SWCD land use estimates, this sub-watershed supports 40% forest, 24% pasture, 23% row crops, and 11% urban (Table 2c). Four current construction/stormwater authorizations and 1 semi public/private NPDES permit have been issued in the sub-watershed (Table 9c).

NPS impairment potential: The potential for impairment from pasture runoff and soil erosion was estimated as *high* (Table 5c). The local SWCD estimates of animal concentrations and forestry land use indicated *moderate* potentials for impairment (Table 5c). The overall potential for impairment from nonpoint sources was estimated as *high* (Table 5c).

Assessments: Three stream reaches were sampled in 1994 by Troy State Universities Center for Environmental Research and Service. In 1999, a stream segments was evaluated as part of ADEM's *ALAMAP* program (Appendices F-8c and F-9c).

NPS Priority Status: Walnut Creek has been listed on ADEM's 1998 §303(d) list due to unknown toxicity (Table 11c).

Sub-Watershed: Whitewater Creek	**NRCS Sub-Watershed Number 070**

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
TSCP-30	C	1994	Mims Creek @ Pike Co. Rd.59	10	F&W
TSCP-8	C	1994	Whitewater Creek @ Coffee Co. Rd. 224	160	F&W
WWCP-1	C, H, M	1998, 1999	Whitewater Creek @ Pike Co. Rd. 33	105	F&W
WWCC-2	C, H, M, F	1998, 1999	Whitewater Creek @ Coffee Co. Rd. 215	148	F&W
WWCC-3	C, H, M, F	1999	Whitewater Creek @ Al Hwy 167	123	F&W
WWCC-4	C, H, M	1999	Whitewater Creek @ Coffee Co. Rd. 224	160	F&W

Land use: The Whitewater Creek sub-watershed drains approximately 96 mi^2 in Coffee and Pike Counties. SWCD estimated land use as mainly forest (56%), row crops (24%), and pasture (15%), (Table 2c). Three current construction/stormwater authorizations and one municipal NPDES permit have been issued in the sub-watershed (Table 9c).

NPS impairment potential: The overall potential for impairment from nonpoint sources was estimated as *high* (Table 5c). NPS concerns within the sub-watershed included; livestock, cropland, pasture, mining, silviculture, and soil erosion (Table 5c). There was a *moderate* potential for impairment from urban development (Table 5c).

Assessments: In 1994, two stream segments were monitored by Troy State University's Center for Environmental Research and Service (Table 8c and Appendix F-4c). Two stream reaches were monitored within the sub-watershed as part of the Southeast Alabama Poultry Industry Impact Study. Nine visits were made to the WWCP-1 and WWCC-2 stream reaches over a thirteen month period while collecting a baseline of data to better assess the potential of impact from the increased poultry activity in the region.

Whitewater Creek: The WWCP-1 location was assessed as part of the Southeast Alabama Poultry Industry Impact Study. Macroinvertebrate community assessments were conducted at WWCP-1 in 1998 and 1999. The stream reach was evaluated with a *good* aquatic macroinvertebrate community in both years (Table 7c). Water chemistry samples were collected nine different times from August 1998 through September 1999. Overall water quality data collected from 1998-99 indicated nutrient enrichment (Appendices F-6C).

The WWCC-2 location was assessed as part of the Southeast Alabama Poultry Industry Impact Study. Habitat assessments and aquatic macroinvertebrate community assessments were conducted at WWCC-2 in 1998 and 1999. A fish community assessment was conducted in 1999. The stream reach was evaluated with a *good* aquatic macroinvertebrate community in both years (Table 7c). The fish assessment conducted in 1999 indicated a *fair* fish community (Table 7c). The sampling reach at WWCC-2 had a partly-open/partly-shaded canopy and was dominated by clay (~53%) with lesser amounts of sand (~40%), detritus (~4%) and silt (~3%) substrates (Table 6c). Habitat quality was assessed as *excellent* using the riffle/run assessment matrix (Table 6c). Water chemistry samples were collected nine times from August 1998 through September 1999. Continuing with what was observed at the upstream station (WWCP-1) the overall water quality data collected from 1998-99 indicated elevated nutrient concentrations as compared to reference streams in the region (Appendices F-3, F-6C). Habitat and aquatic macroinvertebrate community assessments were conducted at WWCC-3 in June 1999. The sampling reach at WWCC-3 had a shaded canopy and was dominated by sand (~80%) with lesser amounts of detritus (~12%), silt (~7%) and organic silt (~1%) substrates (Table 6c). Habitat quality was assessed as *excellent* using the glide/pool assessment matrix (Table 6c). Nine EPT families were collected indicating a *good* aquatic macroinvertebrate community. A fish community survey and chemical assessment was conducted in July 1999. The fish sample collected indicated the stream reach had *fair* fish community (Table 7c). Water chemistry samples collected in July 1999 indicated nutrient enrichment similar to the upstream stations (Appendix D-1c, D-2c). Habitat and macroinvertebrate community assessments were conducted at WWCC-4 in 1999. The sampling reach at WWCC-4 had an open canopy and was dominated by clay (~73%) with lesser amounts of sand (~20%), detritus (~5%) and silt (~2%) substrates (Table 6c). Habitat quality was assessed as *excellent* using the riffle/run assessment matrix (Table 6c). Ten EPT families were collected indicating a *good* aquatic macroinvertebrate community (Table 7c).

NPS Priority Status: The Whitewater Creek is recommended as a low priority sub-watershed (Table 14c). Monitoring of the sub-watershed indicated moderate impairment of the fish community at two stream segments. The potential for NPS impairment from mining was estimated as high and chemical sampling showed BOD concentrations to be periodically high and a potential source of the impairment (Appendix F-6c).

Sub-Watershed: Big Creek	**NRCS Sub-Watershed Number 080**

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
TSCP-7	C	1994	Big Creek @ Coffee Co. Rd. 324	60	F&W
UTBC-1	C	1999	Unnamed tributary of Big Creek @ Coffee Co. Rd. 340	2	F&W
UTBC-2	C, H, M	1999	Cowpen Creek @ Coffee Co. Rd. 315	4	F&W
UTBC-3	C	1999	Sweetwater Creek @ Coffee Co. Rd. 304	9	F&W
UTBC-4	C	1999	Fishpond Creek @ Coffee Co. Rd. 308	2	F&W

Land use: The Big Creek sub-watershed drains approximately 114 mi^2 in Coffee and Pike Counties. Land use was primarily forest (62%) mixed with some row crop (18%) and pasture land (15%) (Table 2c). Five current construction/stormwater authorizations have been issued in the sub-watershed (Table 9c).

NPS impairment potential: The overall potential for impairment from nonpoint sources was estimated as *high* (Table 5c). NPS concerns within the sub-watershed included livestock,

cropland, pasture, mining, silviculture, and soil erosion (Table 5c). There was a *moderate* potential for impairment from urban development (Table 5c).

Assessments: In 1994, one stream segment was monitored by Troy State University's Center for Environmental Research and Service, (Appendix F-4c). One aquatic macroinvertebrate (Table 7c) and three chemical assessments (Appendix F-5C) were conducted on stream segments during the 1999 §303(d) stream sampling that was completed in conjunction with the NPS screenings. Cowpen Creek is listed on Alabama's 1998 §303(d) list of impaired waterbodies (Table 11c).

Cowpen Creek: Habitat and aquatic macroinvertebrate community assessments were conducted at UTBC-2 in 1999. The sampling reach at UTBC-2 had a mostly open canopy and was dominated by sand (~80%) with lesser amounts of detritus (~18%) and silt (~2%) substrates (Table 6c). Habitat quality was assessed as *excellent* using the glide/pool assessment matrix (Table 6c). Six EPT families were collected indicating a *fair* aquatic macroinvertebrate community (Table 7c).

NPS Priority Status: This sub-watershed was identified as a priority based on impaired biological conditions. This sub-watershed was monitored as part of the 303(d) sampling conducted 1999. The impairment may result from point and nonpoint sources (Table 14c).

Sub-Watershed: Whitewater Creek	**NRCS Sub-Watershed Number 090**

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
TSCP-31	C	1994	Pea Creek @ Coffee Co. Rd. 330	7	F&W
TSCP-9	C	1994	Pea River @ HWY 84	959	F&W

Land use: The Whitewater Creek sub-watershed drains approximately 33 mi^2 in Coffee and Crenshaw Counties. Land use was estimated 79% forest, 10% crop land, and 8% pasture (Table 2c). One current construction/stormwater authorization has been issued in the sub-watershed (Table 9c).

NPS impairment potential: There was a *moderate* potential for NPS impairment from silviculture in the watershed (Table 5c). The potential for impairment from all other NPS categories was estimated as *low*.

Assessments: In 1994, two stream segments were monitored by Troy State University's Center for Environmental Research and Service (Appendix F-4c).

Sub-Watershed: Pea River	**NRCS Sub-Watershed Number 100**

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
CHO07	C	1996	Pea River @ Coffee Co. Rd. 474	1105	F&W
CHO10	C	1996	Cripple Creek @ Coffee Co. Rd. 470	11	F&W
CHO11	C	1996	Cripple Creek @ Coffee Co. Rd. 473	14	F&W
CW2A4-14	H,C	2000	Phillips Creek		F&W
TSCP-49	C	1994	Beaverdam Creek @ Coffee Co. Rd. 353	6	F&W
PATC-1	H, M, F, C	1999	Patrick Creek @ Coffee Co. Rd. 368	9	F&W

Land use: The Pea River drains approximately 235 mi^2 in Coffee, Covington and Geneva Counties. Land use was estimated as 51% forest, 31% row crops, and 11% pasture (Table 2c). Seventy current construction/stormwater authorizations and 4 municipal NPDES permits have been issued in the sub-watershed (Table 9c).

NPS impairment potential: The overall potential for impairment from nonpoint sources was estimated as *high* (Table 5c). There was a moderate potential for impairment from several nonpoint sources, including livestock, silviculture, aquaculture, cropland, pasture, and sedimentation (Table 5c). The number of current construction/stormwater authorizations indicated a *high* potential for impairment from urban development (Table 5c).

Assessments: Three stream segments were monitored in 1996 as part of ADEM's CWS sampling efforts (Appendix F-10c). One station was sampled as part of the NPS screening assessments.

Patrick Creek: The stream reach at PATC-1 has been sampled as an ecoregional reference site since 1991. As part of the NPS assessment conducted in Southeast Alabama, habitat and macroinvertebrate community assessments were conducted in June 1999. The sampling reach at PATC-1 was dominated by sand (84%) with lesser amounts of detritus (11%), and silt (5%). Habitat quality was assessed as *excellent* using the glide/pool assessment matrix (Table 6c). Six EPT families were collected indicating a *fair* aquatic macroinvertebrate community (Table 7c). The PATC-1 stream reach fish community was also sampled in 1999. The number and diversity of species indicated a *poor* fish community

NPS Priority Status: The Pea River sub-watershed is recommended as a low priority based on impaired biological conditions (Table 14c). The potential for NPS impairment from animal concentrations and sedimentation was estimated as moderate and a potential source of the impairment.

Sub-Watershed: Flat Creek	**NRCS Sub-Watershed Number 110**

Station	Assessment Type	Date	Location	Area (mi2)	Class.
FTCG-2	C, H, M	1999	Flat Creek @ unnamed Co. Rd. E. of Hacoda	88	F&W
FTCG-3	C, H, M	1999	Flat Creek @ unnamed Co. Rd. S4/T2N/R19W	19	F&W
PRCG-1	C, H, M	1999	Panther Creek @ unnamed Co. Rd.	26	F&W

Land use: The Flat Creek sub-watershed drains approximately 89 mi^2 in Coffee, Covington and Geneva Counties. Land use was estimated as 66% forest, 22% cropland, and 8% pasture (Table 2c). Five current construction/stormwater authorizations have been issued in the sub-watershed (Table 9c).

NPS impairment potential: The overall potential for impairment from nonpoint sources was estimated as *moderate* (Table 5c). The main NPS concerns within the sub-watershed were estimated to be animal husbandry, aquaculture, runoff from cropland, and sedimentation (Table 5c). There was a *moderate* potential for impairment from urban development (Table 5c).

Assessments: Three stream segments were monitored as part of the NPS assessment.

Flat Creek: Habitat assessment and macroinvertebrate community assessment was conducted at FTCG-2 in May 1999. The sampling reach at FTCG-2 had a shaded canopy and was dominated

by sand (~90%) with lesser amounts of detritus (~8%) and silt (~2%) substrates (Table 6c). Habitat quality was assessed as *excellent* using the glide/pool assessment matrix (Table 6c). Seven EPT families were collected indicating a *good* aquatic macroinvertebrate community (Table 7c). Habitat assessment and macroinvertebrate community assessment were also conducted at the FTCG-3 stream reach in May 1999. This downstream stations reach was also had a shaded canopy and was dominated by sand (~75%) with lesser amounts of detritus (~20%), gravel (~2%), silt (~2%), and clay (~1%) substrates (Table 6c). Habitat quality was assessed as *excellent* using the glide/pool assessment matrix (Table 6c). Eight EPT families were collected indicating a *good* aquatic macroinvertebrate community (Table 7c).

Panther Creek: Habitat and aquatic macroinvertebrate community assessments were conducted at PRCG-1 in May 1999. The sampling reach at PRCG-1 had a mostly shaded canopy and was dominated by sand (~76%) with lesser amounts of detritus (~21%), silt (~2%), and clay (~1%) substrates (Table 6c). Habitat quality was assessed as *excellent* using the glide/pool assessment matrix (Table 6c). Nine EPT families were collected indicating a *good* aquatic macroinvertebrate community (Table 7c).

Sub-Watershed: Corner Creek	**NRCS Sub-Watershed Number 130**

Land use: The Corner Creek sub-watershed drains approximately 81 mi^2 in Covington and Geneva Counties. Land use was estimated as 55% forest, 26% row crops, and 11% pasture (Table 2c). Four current construction/stormwater authorizations and 1 mining NPDES permit have been issued in the sub-watershed (Table 9c).

NPS impairment potential: The overall potential for impairment from nonpoint sources was estimated as *moderate* (Table 5c). The potential for impairment caused by runoff from cropland and pasture was estimated as *moderate*. There was a *moderate* potential for impairment associated with animal husbandry and aquaculture land uses. Sediment erosion was also a concern within the sub-watershed (Table 5c). The potential for impairment from urban runoff and development was *moderate* (Table 5c).

Assessments: No assessments have been conducted in this subwatershed.

Sub-Watershed: Pea River	**NRCS Sub-Watershed Number 140**

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
CHO14	C	1996	Sandy Creek @ Geneva Co. Rd. 16	3	F&W
CHO15	C	1996	Sandy Creek @ Geneva Co. Rd. 65	25	F&W
CW3U4-26	H,C	2000	Unnamed tributary to sandy Creek	1-2	F&W
SYCG-1	C, H, M	1999	Sandy Creek @ Geneva Co. Rd. 4	25	F&W

Land use: The Pea River sub-watershed drains approximately 80 mi^2 in Geneva County. Land use was estimated as 45% row crops, 34% forest, 15% pasture, and 6% other land uses (Table 2c). Three current construction/stormwater authorizations and one municipal NPDES permit have been issued in the sub-watershed (Table 9c).

NPS impairment potential: There was a *high* potential for impairment from aquaculture and cropland runoff (Table 5c). The potential for impairment from animal husbandry and silviculture was *moderate* (Table 5c). The potential for impairment from pasture runoff and sedimentation

was also *moderate* (Table 5c). The overall potential for impairment from nonpoint was estimated as *high* sources (Table 5c). The potential for impairment from urban development was moderate (Table 5c).

Assessments: Two stream segments were monitored in 1996 as part of ADEM's CWS sampling efforts (Appendix F-10c). One stream was monitored in 1999, in conjunction with the NPS screenings.

Sandy Creek: Habitat and aquatic macroinvertebrate community assessments were conducted at SYCG-1 in May 1999. The sampling reach at SYCG-1 had a mostly-open canopy and was dominated by sand (~85%) with lesser amounts of detritus (~12%), organic silt (~2%) and gravel (~1%) substrates (Table 6c). Habitat quality was assessed as *excellent* using the glide/pool assessment matrix (Table 6c). Eight EPT families were collected indicating a *good* aquatic macroinvertebrate community (Table 7c).

Lower Choctawhatchee CU (0314-0203)

Land use: The primary land-uses throughout the Pea River cataloging unit were cropland and forestland (Table 12b). It contains 3 sub-watersheds located within Coffee, Covington, and Crenshaw Counties (Fig 3). The CU is located in the Southeastern Plains Ecoregion (Subecoregions 65g) and drains Coastal Plain soils (NRCS 1997).

Percent land cover estimated by local SWCD (ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
34%	45%	15%	0%	1%	0%	5%

NPS impairment potential: Three sub-watersheds were estimated to have a *high* potential for impairment from nonpoint sources. The main NPS concerns were runoff from aquaculture, row crops, animal production operations, and pastures. Impairment from development runoff was estimated as a *moderate* concern in 1 sub-watershed (Table 5c).

Number of sub-watersheds with (M)oderate or (H)igh ratings for each NPS category (Table 5a).

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Moderate	0	3	0	0	3	0	2	3
High	3	0	3	3	0	0	0	0

Number of sub-watersheds with (M)oderate or (H)igh ratings for each point source category (Table 5a).

Category	% Urban	Development	Septic tank failure
Moderate	0	1	0
High	0	0	0

Historical data/studies: Water quality assessments have been conducted recently within 1 of the 3 sub-watersheds in the cataloging unit (Table 8c). In 1996, ADEM monitored 2 stations associated with its Clean Water Strategy (CWS) sampling efforts (Appendix F-10c). A summary of the CWS study, including lead agency, project objectives, data collected, and applicable quality assurance manuals is provided with the appropriate appendices.

Assessments conducted: Table 10c lists the stations assessed in conjunction with the Southeast NPS Screening Assessment. One station located within the Holmes Creek (130) sub-watershed was assessed. Results of habitat and biological assessments are presented in Tables 6c and 7c, respectively. Chemical/physical data are provided in Appendices D-1a and D-2a.

Sub-watershed summaries: Current and historical monitoring data were used to provide a comprehensive assessment. A summary of the information available for both sub-watersheds is provided. Each summary discusses land use, NPS impairment potential, assessments conducted within the sub-watershed, and NPS priority rating based on available data. The summaries point out significant data and reference appropriate tables and appendices. Assessment of habitat, biological, and chemical conditions is based on long-term data from ADEM's Ecoregional Reference Site Program.

Sub-watershed assessments: Habitat, chemical/physical, and biological indicators of water quality were monitored at one location on Holmes Creek within the Holmes Creek sub-watershed (Table 13c). Habitat quality was assessed as *excellent* (Table 6c). Results of the macroinvertebrate assessment indicated the macroinvertebrate community to be in *good* condition (Table 7c). The fish community assessment (Table 7c) indicated the fish community to be in *fair* condition.

The overall condition for each station was rated as the lowest assessment result obtained (Table 13c). The Holmes Creek station was assessed as *fair* or moderately impaired.

NPS priority sub-watersheds: A sub-watershed was recommended for NPS priority status if the macroinvertebrate or fish community was assessed as *fair* or *poor*. Bioassessment results indicated biological impairment to the fish communities at the Holmes Creek (HSCG-1) station (Table 13c). This sub-watershed was recommended for NPS priority status (Table 14c).

Sub-Watershed: Spring Creek	**NRCS Sub-Watershed Number 010**

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
CHO12	C	1996	Spring Creek @ Geneva Co. Rd. 61	13	F&W
CHO13	C	1996	Spring Creek @ Geneva Co. Rd. 4	42	F&W

Land use: The Spring Creek sub-watershed drains approximately 67 mi^2 in Geneva County. Based on SWCD land use estimates, this sub-watershed supports 45% cropland, 34% forest, and 15 % pasture (Table 2c). Three current construction/stormwater authorizations have been issued in the sub-watershed (Table 9c).

NPS impairment potential: The overall potential for impairment from nonpoint sources was estimated as *high* (Table 5c). There was a *high* potential for impairment from aquaculture and cropland runoff. The potential for impairment from animal husbandry and silviculture was

moderate. The potential for impairment from pasture runoff and sedimentation was also *moderate*. The potential for impairment from urban development was *moderate* (Table 5c).

Assessments: Two stream segments were monitored in 1996 as part of ADEM's CWS sampling efforts (Table 8c and Appendix F-10c).

Sub-Watershed: Wrights Creek	**NRCS Sub-Watershed Number 050**

Land use: The Wright Creek sub-watershed drains approximately 50 mi^2 in Geneva County. Land use was estimated as 45% cropland, 34% forest, and 15% pasture (Table 2c). One current construction/stormwater authorization has been issued in the sub-watershed (Table 9c).

NPS impairment potential: There was a *high* potential for impairment from aquaculture and cropland runoff (Table 5c). The potential for impairment from animal husbandry and silviculture was *moderate*. The potential for impairment from pasture runoff and sedimentation was also *moderate*. The overall potential for impairment from nonpoint sources was estimated as *high.*

Assessment: No assessments were conducted within this sub-watershed.

Sub-Watershed: Holmes Creek	**NRCS Sub-Watershed Number 130**

Station	Assessment Type	Date	Location	Area (mi^2)	Class.
HSCG-1	C, H, M, F	1999	Holmes Creek @ Geneva Co. Rd. 4	6	F&W

Land use: The Holmes Creek sub-watershed drains approximately 18 mi^2 in Geneva and Houston Counties. Land use was estimated as 45% row crops, 34% forest, and 15% pasture (Table 2c). One current construction/stormwater authorization has been issued in the sub-watershed (Table 9c).

NPS impairment potential: There was a *high* potential for impairment from aquaculture and cropland runoff (Table 5c). The potential for impairment from animal husbandry, pasture runoff, and sedimentation was also *moderate*. The overall potential for impairment from nonpoint sources was estimated as *high.*

Assessments: One station was monitored within this sub-watershed during the NPS screening assessment.

NPS Priority Status: Holmes Creek is recommended as a NPS priority based on moderate impairment of the fish community at HSCG-1. The potential for NPS impairment from aquaculture and row crop runoff was estimated as high.

Holmes Creek: A habitat assessment, macroinvertebrate community assessment and fish community assessment was conducted at HSCG-1 in 1999. The stream reach was evaluated as *excellent*, *good* and *fair* for habitat, macro-invertebrate and fish assessments, respectively. (Table 7c). The sampling reach had a mostly open canopy and was dominated by sand (~59%) with less detritus (~21%), silt (~15%) and clay (~5%) substrates (Table 6c). Habitat quality was assessed

as *excellent* using the glide/pool assessment matrix (Table 6c). Six EPT families were collected indicating a *good* aquatic macroinvertebrate community (Table 7c).

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Table 2c. Land use percentages for the Upper Choctawhatchee cataloging unit (0314-0201) from EPA landuse categories (EPA 1997) and local SWCD Conservation Assessment Worksheet landuse estimates (ASWCC 1998).

Sub-Watershed	Percent Total Landuse													
	Open Water		Urban		Mines		Forest		Pasture		Row Crops		Other	
	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA
Upper Choctawhatchee River (0314-0201)														
010	1	1	<1		1	<1	62	59	16	7	17	25	2	8
020	2	<1					51	63	20	8	24	18	2	10
030	2	<1	7	1			35	32	17	26	38	37	2	3
040	1	<1	5				38	49	13	19	39	28		3
050	1	<1	1		<1		64	60	10	8	22	25	1	6
060	1	<1	<1				70	71	10	6	18	19	1	3
070	2	<1					44	79	27	5	27	11		4
080	1	<1	<1				69	77	10	5	19	14	1	4
090	1	<1	1				62	71	8	6	27	17	<1	5
100	3	1	21	1			37	79	12	5	28	9		5
110	2	1	28	5			44	70	10	5	15	14		6
120	1	<1	2	1		<1	54	61	17	13	26	21		2
130	<1	1	5	3		<1	32	33	19	23	42	32	3	7
140	1	1	2	1			55	79	7	5	15	11	20	3
150	<1	1	4	1			63	87	3	4	4	7	26	1
160	2	<1	37	5			27	60	11	8	23	15		11
170	<1	<1	55	14		<1	36	57	5	8	4	16		5
180	<1	<1	40	10		<1	10	43	5	14	45	28		5
190	2	1	18				32	53	22	13	26	31		2
200	---	<1	---		---		---	25	---	15	---	59	---	1
210	<1	1	4				19	35	16	24	60	36	1	4
220		1	1			<1	34	47	15	16	45	23	5	13
230	1	1	4	1			50	47	12	15	33	29	1	7
240	<1	1	3			<1	46	37	13	23	36	34	2	5
250	<1	1	1			<1	37	40	14	16	48	29		13

Table 2c. cont., Land use percentages for the Pea River (0314-0202) and Lower Choctawhatchee River (0314-0203) cataloging units from EPA landuse categories (EPA 1997) and local SWCD Conservation Assessment Worksheet landuse estimates (ASWCC 1998).

Sub-Watershed	Percent Total Landuse													
	Open Water		Urban		Mines		Forest		Pasture		Row Crops		Other	
	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA
Pea River (0314-0202)														
010	<1	<1			<1		88	77	4	3	6	11	1	9
020	<1	<1	1			<1	65	71	12	6	20	17	1	5
030	1	<1	<1			<1	64	66	17	9	17	17	2	6
040	<1	<1	2				70	71	11	7	16	16	1	5
050	1	1	<1		2	<1	39	52	28	16	28	23	2	8
060	1	1	11	3		<1	40	57	23	10	24	19	2	9
070	<1	<1	3		1		56	70	15	7	24	15	1	7
080	1	1	2		1		62	70	15	7	18	15	1	7
090	<1	<1	3				79	88	8	4	10	6		1
100	<1	1	5			<1	51	56	11	15	31	23	1	3
110	1	<1					66	69	8	12	22	15	2	3
130	<1	1	5				55	67	11	12	26	14	3	6
140		1	1	1		<1	34	56	15	13	45	16	5	12
Lower Choctawhatchee River (0314-0203)														
010		1	1			<1	34	37	15	18	45	33	5	11
050		1	1				34	30	15	24	45	32	5	12
130		1	1				34	35	15	26	45	25	5	13

Table 3c. Estimations of animal concentrations, animal units (AU), and percent of acres where pesticides/herbicides applied in the Upper Choctawhatchee Cataloging Unit (0314-0201). Numbers of animals and pesicides/herbicides listed by acreage and subwatershed were provided by the local SWCDs on Conservation Assessment Worksheets completed in 1998.

		U. Choctawhatchee (0314-0201)																			
		010	020	030	040	050	060	070	080	090	100	110	120	130	140	150	160	170	180	190	200
County (s)		Barbour Henry	Dale Henry	Dale Henry	Dale	Barbour Dale	Barbour Dale	Barbour	Barbour Dale	Barbour Dale	Dale	Dale	Dale	Dale Geneva Houston	Dale	Coffee	Dale	Coffee	Coffee	Dale	Coffee Dale
Acres Reported		100	104	100	112	101	107	93	96	104	96	113	103	101	95	74	59	71	69	118	0
Pesticides Applied	Est. % Total Acres	17.34	62.62	67.03	*	13.05	25.23	75.55	38.36	60.70	78.06	43.63	*	25.27	42.73	3.23	69.37	*	32.76	*	*
Cattle	# / Acre	0.08	0.08	0.07	0.05	0.06	0.05	0.04	0.04	0.04	0.04	0.02	0.04	0.09	0.04	0.02	0.03	0.04	0.04	0.09	*
	A.U./Acre	0.08	0.08	0.07	0.05	0.06	0.05	0.04	0.04	0.04	0.04	0.02	0.04	0.09	0.04	0.02	0.03	0.04	0.04	0.09	*
Dairy	# / Acre													<0.01							*
	A.U./Acre													<0.01							*
Swine	# / Acre	0.02	0.01	0.02	0.01	<0.01	0.01	0.01	0.01	0.01	0.01	<0.01		0.01	0.01	0.01	<0.01			0.02	*
	A.U./Acre	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01	<0.01	<0.01	<0.01			0.01	*
Poultry - Broilers	# / Acre	5.56	8.91			6.20	4.65	50.19	20.51	34.44	17.51	22.94	28.31	6.59	36.70					363.75	*
	A.U./Acre	0.04	0.07			0.05	0.04	0.40	0.16	0.28	0.14	0.18	0.23	0.05	0.29					2.91	*
Poultry - Layers	# / Acre										0.56			0.13							*
	A.U./Acre										<0.01			<0.01							*
Total	A.U./Acre	**0.13**	**0.16**	**0.08**	**0.05**	**0.11**	**0.09**	**0.44**	**0.21**	**0.32**	**0.19**	**0.20**	**0.27**	**0.15**	**0.33**	**0.03**	**0.03**	**0.04**	**0.04**	**3.01**	*
Potential for NPS Impairment		Mod	Mod	Mod	Low	Mod	Mod	High	High	High	Mod	High	High	Mod	High	Low	Low	Low	Low	High	*
Aquaculture	% Total Acres		0.02	0.01	0.01	0.04		0.04	0.34	0.13	0.04	0.05	0.05	0.05	0.04		0.03			0.09	*

* No data reported for this portion of the subwatershed

Table 3c. cont., Estimations of animal concentrations, animal units (AU), and percent of acres where pesticides/herbicides applied in the Upper Choctawhatchee River (0314-0201), Pea River (0314-0202) and Lower Choctawhatchee (0314-0203) Cataloging Units. Numbers of animals and pesicides/herbicides listed by acreage and subwatershed were provided by the local SWCDs on Conservation Assessment Worksheets completed in 1998.

		U. Choctawhatchee (CU 0314-0201)					Pea River (0314-0202)													L. Choctawhatchee (0314-0203)		
		210	220	230	240	250	010	020	030	040	050	060	070	080	090	100	110	130	140	010	050	130
County (s)		Coffee	Geneva	Coffee Geneva	Coffee Geneva	Coffee Geneva	Barbour Bullock Pike	Barbour	Barbour Bullock Pike	Barbour Coffee Dale Pike	Pike	Pike	Coffee Pike	Coffee Pike	Coffee	Coffee Covington Geneva	Covington Geneva	Covington Geneva	Geneva	Geneva	Geneva	Geneva
Acres Reported		76	99	100	100	100	100	100	100	100	100	100	100	100	86	100	95	100	100	100	100	78
Pesticides Applied	Est. % Total Acres	43.11	*	25.12	29.59	18.24	3.61	5.95	14.75	15.72	28.09	23.45	20.49	16.23	7.23	20.04	9.25	11.05	18.89	*	19.67	15.48
Cattle	# / Acre	0.13	0.11	0.09	0.04	0.10	0.03	0.06	0.08	0.06	0.11	0.09	0.08	0.08	0.06	0.08	0.05	0.07	0.11	0.11	0.11	0.09
	A.U./Acre	0.13	0.11	0.09	0.04	0.10	0.03	0.06	0.08	0.06	0.11	0.09	0.08	0.08	0.06	0.08	0.05	0.07	0.11	0.11	0.11	0.09
Dairy	# / Acre	0.04																				
	A.U./Acre	0.05																				
Swine	# / Acre		0.01	<0.01	0.01	0.01	<0.01	<0.01	0.01	<0.01						<0.01	<0.01	0.01	0.01	0.01	0.01	0.01
	A.U./Acre		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01						<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Poultry - Broilers	# / Acre		0.10	0.01	0.04	0.08	2.91	3.88	6.01	4.93	12.97	9.36	2.88	5.27		1.40	9.22	2.00	0.01	0.10	0.10	0.08
	A.U./Acre		<0.01	<0.01	<0.01	<0.01	0.02	0.03	0.05	0.04	0.10	0.07	0.02	0.04		0.01	0.07	0.02	<0.01	<0.01	<0.01	<0.01
Poultry - Layers	# / Acre		<0.01	<0.01	<0.01	<0.01	0.24		0.85	0.48	0.96	1.53				<0.01	0.23	<0.01	<0.01	<0.01	<0.01	<0.01
	A.U./Acre		<0.01	<0.01	<0.01	<0.01	<0.01		0.01	<0.01	0.01	0.01				<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total	A.U./Acre	**0.18**	**0.12**	**0.09**	**0.04**	**0.10**	**0.05**	**0.10**	**0.14**	**0.11**	**0.22**	**0.18**	**0.10**	**0.12**	**0.06**	**0.10**	**0.13**	**0.09**	**0.11**	**0.11**	**0.11**	**0.09**
Potential for NPS Impairment		Mod	Mod	Mod	Low	Mod	Low	Mod	Mod	Mod	High	Mod	Mod	Mod	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod
Aquaculture	% Total Acres		0.08	0.01	0.03	0.07		0.18	0.10	0.06						0.02	0.02	0.03	0.08	0.08	0.08	0.07

* No data reported for this portion of the subwatershed

Table 4c. Sedimentation estimates by source, forest condition, septic tank information and resource concerns by subwatershed in the Upper Choctawhatchee River (CU 0314-0201) cataloging unit as provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets (ASWCC 1998). (* Indicates not reported)

Basin Code- Cataloging Unit	0314-0201												
Subwatershed	**010**	**020**	**030**	**040**	**050**	**060**	**070**	**080**	**090**	**100**	**110**	**120**	**130**
Forest Condition													
% of Subwatershed Needing Forest Improvement	13	23	16	*	2	8	13	14	8	11	13	15	13
Sediment Contributions (Tons/Acre/Year)													
Cropland	0.5	0.6	0.9	0.3	0.7	0.6	0.8	0.6	0.4	0.8	0.4	0.8	1.0
Sand & Gravel Pits	<0.1	<0.1	<0.1		<0.1				0.0		<0.1		<0.1
Mined Land	0.8				<0.1				0.0				
Developing Urban Land			0.2	0.2					0.0	0.1	0.2	0.1	0.1
Critical Areas	0.3	0.3	0.7	0.1	0.1	0.5	0.2	0.1	0.4	0.2	0.3	1.4	0.4
Gullies	1.9	0.6	3.6	0.4	0.8	2.0	0.1	0.4	1.5	0.8	0.9	4.8	0.5
Stream Banks	0.4	0.6	0.3	0.1	0.1	0.1	0.7	0.1	0.1	0.1	0.1	0.2	1.0
Dirt Roads and Roadbanks	1.6	3.5	2.8	0.1	0.3	0.3	0.1	0.3	0.1	<0.1	<0.1	0.1	0.5
Woodlands	0.4	0.1	0.1	<0.1	0.5	0.4	<0.1	0.6	0.3	<0.1	<0.1	<0.1	0.2
Total Sediment	5.9	5.7	8.7	1.3	2.5	3.8	1.9	2.1	2.8	2.1	2.0	7.5	3.8
Potential for Sediment NPS	Mod	Mod	Mod	Low	Low	Low	Low	Low	Low	Low	Low	Mod	Low
Septic Tanks													
# Septic Tanks per acre	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02
# Septic Tanks Failing per acre*													
# of Alternative Septic Systems*													
Resource Concerns in the Subwatershed													
Excessive Erosion on Cropland	X	X	X		X	X		X	X				X
Gully Erosion on Agricultural Land	X	X	X		X	X		X	X				X
Road and Roadbank Erosion	X	X	X	X	X	X		X	X				X
Poor Soil Condition (cropland)					X				X			X	X
Excessive Animal Waste Applied to Land							X						X
Excessive Pesticides Applied to Land				X									
Excessive Sediment from Cropland	X	X	X		X	X		X	X				X
Excessive Sediment From Roads/Roadbanks	X	X	X		X	X		X	X				X
Excessive Sediment from Urban Development													X
Inadequate Management of Animal Wastes						X							
Nutrients in Surface Waters	X				X	X		X	X				
Pesticides in Surface Waters	X	X	X		X	X		X	X				X
Livestock Commonly have Access to Streams	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 4c. cont., Sedimentation estimates by source, forest condition, septic tank information and resource concerns by subwatershed in the Upper Choctawhatchee River (CU 0314-0201) cataloging unit as provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets (ASWCC 1998). (* Indicates not reported)

Basin Code- Cataloging Unit	0314-0201												0314-0202		
Subwatershed	**140**	**150**	**160**	**170**	**180**	**190**	**200***	**210**	**220**	**230**	**240**	**250**	**010**	**020**	**030**
Forest Condition															
% of Subwatershed Needing Forest Improvement	16	23	8	13	3	9	*	8	25	18	21	22	2	*	18
Sediment Contributions (Tons/Acre/Year)															
Cropland	0.4	0.1	0.7	0.1	1.2	0.8	*	1.6	1.2	0.9	1.0	1.3	0.2	0.6	0.5
Sand & Gravel Pits							*		0.1			<0.1	0.6	<0.1	<0.1
Mined Land							*								
Developing Urban Land	<0.1	<0.1	0.2	2.6	1.9	2.2	*	0.5		0.2	<0.1	<0.1			<0.1
Critical Areas	<0.1	0.2	0.2	2.2	0.2	0.6	*	0.3	0.8	2.0	1.7	0.4	0.1	<0.1	0.8
Gullies	0.2	1.1	0.8	1.5	1.5	1.9	*	2.0	0.9	1.3	1.1	0.4	0.3	1.0	3.0
Stream Banks	0.1		0.2			0.2	*		2.7	0.3	0.5	1.2	0.3	<0.1	0.4
Dirt Roads and Roadbanks	0.2	<0.1		<0.1	<0.1	0.1	*	<0.1	0.9	0.3	0.5	0.9	0.3	0.3	1.2
Woodlands	<0.1	0.2	<0.1	0.1	<0.1	<0.1	*	0.1	0.3	0.2	0.2	0.3	0.1	0.6	0.2
Total Sediment	0.7	1.6	2.1	6.5	4.9	5.9	*	4.6	6.9	5.1	5.0	4.5	1.9	2.6	6.1
Potential for Sediment NPS	Low	Low	Low	Mod	Mod	Mod	*	Mod	Mod	Mod	Mod	Mod	Low	Low	Mod
Septic Tanks															
# Septic Tanks per acre	0.01	*	0.01	*	*	0.01	*	*	0.01	0.00	0.01	0.01	0.02	0.01	0.01
# Septic Tanks Failing per acre*							*								
# of Alternative Septic Systems*							*								
Resource Concerns in the Subwatershed															
Excessive Erosion on Cropland							*		X	X	X	X		X	X
Gully Erosion on Agricultural Land							*		X	X	X	X	X	X	X
Road and Roadbank Erosion							*		X	X	X	X	X	X	X
Poor Soil Condition (cropland)							*						X		
Excessive Animal Waste Applied to Land							*		X	X	X	X	X		X
Excessive Pesticides Applied to Land							*								X
Excessive Sediment from Cropland							*		X	X	X	X		X	X
Excessive Sediment From Roads/Roadbanks	X						*		X	X	X	X	X	X	X
Excessive Sediment from Urban Development							*								
Inadequate Management of Animal Wastes							*								
Nutrients in Surface Waters							*						X	X	X
Pesticides in Surface Waters							*							X	X
Livestock Commonly have Access to Streams	X		X			X	*		X	X	X	X	X	X	X

Table 4c. cont., Sedimentation estimates by source, forest condition, septic tank information and resource concerns by subwatershed in the Pea River (0314-0202) and the Lower Choctawhatchee River (0314-0203) cataloging units as provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets (1998).(*Indicates not reported)

Basin Code- Cataloging Unit	0314-0202										0314-0203		
Subwatershed	**040**	**050**	**060**	**070**	**080**	**090**	**100**	**110**	**130**	**140**	**010**	**050**	**130**
Forest Condition													
% of Subwatershed Needing Forest Improvement	25	26	26	26	27	29	21	15	18	24	24	25	20
Sediment Contributions (Tons/Acre)													
Cropland	0.4	0.9	0.8	0.6	0.5	0.2	0.8	0.6	0.7	1.2	1.2	1.2	1.1
Sand & Gravel Pits	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	<0.1	<0.1	<0.1		
Mined Land		4.4		2.2	1.9		<0.1						
Developing Urban Land	0.1	0.2	6.8	0.7	0.6	<0.1	0.0			<0.1	<0.1		
Critical Areas	1.6	0.8	0.8	1.6	1.4	1.5	1.9	0.4	0.4	0.8	0.8	0.8	0.8
Gullies	1.9	4.0	4.0	2.2	2.6	1.0	1.2	0.3	0.3	0.5	0.4	0.5	0.4
Stream Banks	0.2	0.5	0.6	0.3	0.3		0.5	1.7	1.4	2.1	1.4	1.6	1.1
Dirt Roads and Roadbanks	0.4	1.6	1.6	0.7	0.9	<0.1	0.2	1.7	1.2	0.8	0.9	1.2	1.9
Woodlands	0.2			0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
Total Sediment	4.8	12.4	14.6	8.5	8.4	3.0	4.9	5.1	4.4	5.7	5.1	5.6	5.6
Potential for Sediment NPS	Mod	High	High	Mod	Mod	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod
Septic Tanks													
# Septic Tanks per acre	0.00	0.01	0.04	0.00	0.01	*	0.00	0.01	0.01	0.01	0.01	0.01	0.02
# Septic Tanks Failing per acre*													
# of Alternative Septic Systems*													
Resource Concerns in the Subwatershed													
Excessive Erosion on Cropland	X		X	X			X	X	X	X	X	X	X
Gully Erosion on Agricultural Land	X		X		X		X	X	X	X	X	X	X
Road and Roadbank Erosion	X	X	X	X	X		X	X	X	X	X	X	X
Poor Soil Condition (cropland)					X		X		X				
Excessive Animal Waste Applied to Land		X	X		X		X	X	X	X	X	X	
Excessive Pesticides Applied to Land	X	X	X	X	X								X
Excessive Sediment from Cropland	X	X		X			X	X	X	X	X	X	X
Excessive Sediment From Roads/Roadbanks	X	X	X	X	X		X	X	X	X	X	X	X
Excessive Sediment from Urban Development													
Inadequate Management of Animal Wastes			X		X		X	X					
Nutrients in Surface Waters	X	X	X	X	X								
Pesticides in Surface Waters	X												
Livestock Commonly have Access to Streams	X	X	X	X			X	X	X	X	X	X	X

Table 5c. Estimation of Potential Sources of NPS Impairment for subwatersheds in the Upper Choctawhatchee River (0314-0201) Cataloging Unit. Source categories are based upon information provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets completed in 1998. Estimates of impairment potential from development are from Construction Stormwater Authorization information provided by the Mining and NPS Unit of ADEM. Range of values used to define low, moderate, and high impairment potential for each category are listed in the Methods Tables 1b and 1c. Tables where raw data can be found are provided below.

Cataloging Unit	Sub-watershed	Potential NPS Impairment	Potential Sources of Impairment									
			Animal Husbandry	Aquaculture	Row Crops	Pasture Runoff	Mining	Forestry Practices	Sedimentation	Urban	Development	# Failing Septic Tanks
Raw Data Tables			3c	3c	2c	2c	2c	4c	4c	2c	9c	4c
0314-0201	010	H	M	L	M	M	H	L	M	L	L	L
	020	H	M	M	M	M	L	M	M	L	M	L
	030	M	M	L	M	M	L	L	M	M	L	L
	040	M	L	L	M	M	L	---	L	M	M	L
	050	M	M	M	M	M	L	L	L	L	L	L
	060	M	M	L	M	M	L	L	L	L	L	L
	070	H	H	M	M	H	L	L	L	L	L	L
	080	H	H	H	M	M	L	L	L	L	L	L
	090	M	H	H	M	L	L	L	L	L	L	L
	100	M	H	M	M	M	L	L	L	H	L	L
	110	M	M	M	L	M	L	L	L	H	M	L
	120	H	H	M	M	M	L	L	M	L	L	L
	130	M	M	M	H	M	L	L	L	M	H	L
	140	M	H	M	L	L	L	L	L	L	H	L
	150	L	L	L	L	L	L	M	L	M	M	L
	160	M	L	M	M	M	L	L	L	H	L	L
	170	L	L	L	L	L	L	L	M	H	H	L
	180	M	L	L	H	L	L	L	M	H	L	L
	190	H	H	H	M	H	L	L	M	H	L	L
	200	---	---	---	---	---	---	---	---	---	L	---
	210	M	M	L	H	M	L	L	M	M	M	L
	220	H	M	M	H	M	L	M	M	L	M	L
	230	M	M	L	M	M	L	L	M	M	M	L
	240	M	L	M	M	M	L	M	M	L	L	L
	250	H	M	H	H	M	L	M	M	L	L	L

Table 5c. cont., Estimation of potential sources of NPS impairment for sub-watersheds in the Pea River (0314-0202) and Lower Choctawhatchee River (0314-0203) Cataloging Units. Source categories are based upon information provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets completed in 1998. Estimates of impairment potential from development are from Construction Stormwater Authorization information provided by the Mining and NPS Unit of ADEM. Range of values used to define low, moderate, and high impairment potential for each category are listed in the Methods Tables 1b and 1c. Tables where raw data can be found are provided below.

Cataloging Unit	Sub-watershed	Potential NPS Impairment	Potential Sources of Impairment									
			Animal Husbandry	Aquaculture	Row Crops	Pasture Runoff	Mining	Forestry Practices	Sedimentation	Urban	Development	# Failing Septic Tanks
Raw Data Tables			3c	3c	2c	2c	2c	4c	4c	2c	9c	4c
0314-0202	010	L	L	L	L	L	M	L	L	L	M	L
	020	M	M	H	M	M	L	---	L	L	L	L
	030	H	M	H	M	M	L	L	M	L	M	L
	040	H	M	M	M	M	L	M	M	L	M	L
	050	H	H	L	M	H	H	M	H	L	L	L
	060	H	M	L	M	H	L	M	H	M	M	L
	070	H	M	L	M	M	H	M	M	L	M	L
	080	H	M	L	M	M	H	M	M	L	M	L
	090	L	L	L	L	L	L	M	L	L	L	L
	100	H	M	M	M	M	L	M	M	L	H	L
	110	M	M	M	M	L	L	L	M	L	M	L
	130	M	M	M	M	M	L	L	M	M	M	L
	140	H	M	H	H	M	L	M	M	L	M	L
0314-0203	010	H	M	H	H	M	L	M	M	L	M	L
	050	H	M	H	H	M	L	M	M	L	L	L
	130	H	M	H	H	M	L	L	M	L	L	L

Table 6c. Physical characteristics and habitat quality of sites assessed in the Upper Choctawhatchee River (03140201).

		0201															
		EFCD-2^	JKCH-1	DLCH-1	PRCH-1	SSCD-1	MECD-1	BGCD-1	WTCD-1	BLCD-1	JDYD-1^	JDYD-2	BRH-1*	BVC-2**	HDC-1**	HDC-2**	UTCH-1**
Subwatershed #		020	020	020	020	020	070	070	070	080	100	080	130	130	170	170	170
Date (YYMMDD)		990921	990519	990520	990519	990512	990512	990513	990513	990519	990513	990513	990506	990506	990512	990601	990601
Ecoregion/ Subregion		65d	65d	65d	65d	65d	65d	65d	65d	65d	65d	65d	65g	65g	65d	65d	65g
Drainage area (mi^{-2})				10	12	7			8	8		51	19				
Width (ft)		40	20	12	16	15	6	13	22	18	20	40	25	20	20	15	20
Canopy Cover***		50/50	50/50	S	S	MO	50/50	MS	S	S	MS	MS	S	MO	MS	MS	O
Depth (ft)	Riffle	---	---	---	---	---	---	--	---	---	---	---	---	---	---	---	---
	Run	1.5	0.5	0.4	0.5	0.6	---	---	---	0.3	1.5	1.0	2.5	---	0.5	1.0	---
	Pool	3.0	2.5	1.5	2.5	2.0	1.0	2.5	1.0	2.5	2.5	3.5	>3.5	2.5	2.0	3.5	0.6
Substrate (%)	Bedrock	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Boulder	---	---	---	---	---	2	---	---	---	---	---	---	---	---	---	---
	Cobble	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Gravel	5	---	---	---	3	1	---	---	---	---	---	---	---	2	---	---
	Sand	78	80	89	85	77	76	80	91	92	88	78	65	91	88	45	80
	Silt	2	3	1	3	2	1	2	1	2	2	2	15	2	2	12	18
	Detritus	10	10	10	10	18	20	15	6	5	5	20	10	6	6	12	2
	Clay	5	7	---	2	---	---	1	2	2	5		1		2	30	
	Org. Silt	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Geomorphology		GP	GP	GP	GP	GP	GP	GP	GP	GP	GP	GP	GP	GP	GP	GP	GP
Habitat Survey (% maximum)																	
Instream Habitat Quality		45	35	31	33	47	43	53	23	39	35	60	48	47	32	58	16
Sediment Deposition		73	76	73	74	73	65	84	64	79	80	79	78	73	51	79	16
Sinuosity		45	65	95	68	50	40	38	33	85	35	35	85	40	18	43	18
Bank and Vegetative Stability		53	38	30	59	55	68	83	44	64	63	49	78	80	59	23	41
Riparian Measurements		90	90	90	90	25	90	90	90	93	90	90	90	90	90	50	20
Habitat Assessment Score		139	131	131	137	111	134	159	115	151	139	146	162	150	119	122	54
% Maximum		63	59	59	62	50	61	72	52	69	63	66	73	68	54	55	25
Assessment		E	E	E	E	G	E	E	G	E	E	E	E	E	E	E	P

* Reference Station

** 303(d) Station

***Canopy Cover: S = Shaded, MS = Mostly Shaded, 50/50 = Half Shaded / Half Open, MO = Mostly Open, O = Open

^ Southeast Alabama Industry Impact Study Station

Table 6c. cont., Physical characteristics and habitat quality of sites assessed in the Upper Choctawhatchee River CU (03140201) and Pea River CU (03140202).

		0201			0202								
		CMCG-1	ASCG-1	TECC-2	BSCB-1	DRYB-1	JHCB-1	WWCC-2^	WWCC-3	WWCC-4	UTBC-2**	PATC-1*	FTCG-2
Subwatershed #		220	220	240	010	010	010	070	070	070	080	100	110
Date (YYMMDD)		990506	990512	990526	990603	990608	990603	990601	990615	990601	990602	990601	990511
Ecoregion/ Subregion		65g	65g	65g	65d	65d	65d	65d	65d	65d	65d	65d	65g
Drainage area (mi^2)								148	123			9???	
Width (ft)		21	10	30	15	15	15	35	25	60	5	15	40
Canopy Cover*		MS	MS	S	MS	S	50/50	50/50	S	O	MO	50/50	S
Depth (ft)	Riffle	---	---	---	---	---	---	1	---	0.4	-0.5	---	---
	Run	---	0.3	2.0	---	0.5	0.3	1.5	1.0	2.0	2.0	1.5	1.5
	Pool	2.0	1.5	3.0	3.5	2.0	---	2.5	3.5	4.0		2.5	4.0
Substrate (%)	Bedrock	---	---	---	---	---	---	---	---	---	---	---	---
	Boulder	---	---	---	---	---	---	---	---	---	---	---	---
	Cobble	---	---	---	---	---	---	---	---	---	---	---	---
	Gravel	---	---	---	---	1	---	---	---	---	---	---	---
	Sand	85	90	60	93	96	90	40	80	20	80	84	92
	Silt	3	2		1	1	3	3	7	2	2	5	2
	Detritus	10	7	18	6	2	7	4	12	5	18	11	7
	Clay	1	1	1	---	---	---	53	---	73	---	---	---
	Org. Silt	1	---	21	---	---	---	---	1	---	---	---	---
Geomorphology		GP	GP	GP	GP	GP	GP	RR	GP	RR	GP	GP	GP
Habitat Survey (% maximum)													
Instream Habitat Quality		41	28	57	39	19	13	73	58	76	32	56	47
Sediment Deposition		70	60	78	78	64	63	34	69	56	63	78	73
Sinuosity		35	58	63	75	35	33	75	45	90	73	58	50
Bank and Vegetative Stability		75	45	35	56	34	63	48	38	69	39	39	65
Riparian Measurements		90	78	76	84	83	68	78	90	88	90	88	85
Habitat Assessment Score		142	110	139	141	98	100	151	140	177	118	141	138
% Maximum		64	50	63	64	44	45	63	64	74	54	64	63
Assessment		E	G	E	E	G	G	E	E	E	E	E	E

* Reference Station

** 303(d) Station

^ Southeast Alabama Industry Impact Study Station

Table 6c. cont., Physical characteristics and habitat quality of sites assessed in the Pea River (03140202) and Lower Choctawhatchee River (03140203).

		0202			0203
		FTCG-3	PRCG-1	SYCG-1	HSCG-1
Subwatershed #		110	110	140	130
Date (YYMMDD)		990511	990511	990511	990505
Ecoregion/ Subregion		65g	65g	65g	65g
Drainage area (mi^{-2})					
Width (ft)		28	15	15	11
Canopy Cover*		S	MS	MS	MO
Depth (ft)	Riffle	---	---	---	---
	Run	1.0	1.0	0.5	1.0
	Pool	2.5	2.5	1.5	3.0
Substrate (%)	Bedrock	---	---	---	---
	Boulder	---	---	---	---
	Cobble	---	---	---	---
	Gravel	2	---	1	---
	Sand	75	76	85	59
	Silt	2	2		15
	Detritus	20	21	12	21
	Clay	1	1	---	5
	Org. Silt	---	---	2	---
Geomorphology		GP	GP	GP	GP
Habitat Survey (% maximum)					
	Instream Habitat Quality	59	58	48	55
	Sediment Deposition	76	71	64	78
	Sinuosity	53	55	63	70
	Bank and Vegetative Stability	53	60	54	70
	Riparian Measurements	90	90	90	58
Habitat Assessment Score		143	146	135	145
% Maximum		65	66	61	66
Assessment		E	E	E	E

* Reference Station

** 303(d) Station

^ Southeast Alabama Industry Impact Study Station

Table 7c. Bioassessment results conducted on the Upper Choctawhatchee (0314-0201) River basin by ADEM during 1999.

	U. Choctawhatchee													
Sub-watershed	010	020	020	020	020	020	070	070	070	080	080	100	130	130
Station	EFCB-1^	EFCD-2^	DLCH-1	JKCH-1	PRCH-1	SSCD-1	BGCD-1	MECD-1	WTCD-1	BLCD-1	JDYD-2	JDYD-1^	BRH-1*	BVC-2**
Macroinvertebrate community														
Date (yymmdd)	98/99	98/99	990520	990519	990519	990512	990513	990512	990513	990519	990513	98/99	990506	990506
# EPT families	7/11	13/10	5	4	4	5	5	6	9	4	8	4'/4	6	2
Assessment	F/G	G	F	P	P	F	F	F	G	P	F	P/P	G	P
Fish community														
Date (yymmdd)			990706	990706	990706	990707	990707		990728	990728	990728	990420		
Time (min)			30	30	30	30	30		30	30	30	30		
Richness measures														
# species			5	13	4	18	15		14	16	14	12		
# darter species			1	1	0	4	2		1	3	3	3		
# minnow species			2	5	2	4	6		7	2	6	5		
# sunfish species			0	2	1	3	2		2	5	0	1		
# sucker species			0	0	0	1	1		0	0	1	0		
# intolerant species			0	0	0	0	0		0	0	0	0		
Composition measures														
% sunfish			0	21.1	3.3	16.7	3.3		3.5	27.8	0	1.5		
% omnivores and herbivores			0	5.3	0	8.3	1.6		3.5	6	1.9	4.4		
% insectivourous cyprinids			94.1	42.1	86.7	41.7	79.5		90.4	36.1	89.4	55.9		
% top carnivores			0	7.9	0	1.2	0.008		1.75	3	0	1.5		
Population measures														
Individuals			102	38	30	84	122		114	133	104	68		
# collected per hour			204	76	60	168	244		228	266	208	136		
% disease and anomalies			0	2.6	0	0	0		0	0	0	0		
IBI Score			22	34	28	42	44		42	42	38	36		
Assessment			VP	P	P	F	F		F	F	P-F	P-F		

* Reference Station

** 303(d) Station

^ Southeast Alabama Industry Impact Study Station

Table 7c. cont., Bioassessment results conducted in the Upper Choctawhatchee (0314-0201) and Pea ('0314-0202) River basins by ADEM during 1999.

	U. Choctawhatchee						Pea					
Sub-watershed	170	170	170	220	220	240	010	010	010	030	040	070
Station	HDC-1**	HDC-2**	UTCH-1**	ASCG-1	CMCG-1	TECC-2	BSCB-1	DRYB-1*	JHCB-1	PEAB-1	CLWC-1^	WWCP-1^
Macroinvertebrate community												
Date (yymmdd)	990512	990601	990601	990506	990512	990526	990603	990608	990603	98/99	98	98/99
# EPT families	7	4	0	4	7	9	6	4	7	9/7	8	11/11
Assessment	F	P	P	F	G	G	F	P	F	G/F	F	G/G
Fish community												
								990729				
Time (min)								30				
Richness measures												
# species								9				
# darter species								1				
# minnow species								3				
# species								2				
# sucker species								0				
# intolerant species								0				
Composition measures												
% sunfish								1.5				
% omnivores and herbivores								8.4				
% insectivourous cyprinids								61.6				
% top carnivores								0				
Population measures												
Individuals								263				
# collected per hour								526				
% disease and anomalies								0				
IBI Score								36				
Assessment								P-F				

* Reference Station

** 303(d) Station

^ Southeast Alabama Industry Impact Study Station

Table 7c. cont., Bioassessment results conducted in the Pea ('0314-0202) and Lower Choctawhatchee ('0314-0203) River basins by ADEM during 1999.

						Pea				L. Choctawhatchee
Sub-watershed	070	070	070	080	100	110	110	110	140	130
Station	WWCC-2^	WWCC-3	WWCC-4	UTBC-2**	PATC-1*	FTCG-2	FTCG-3	PRCG-1	SYCG-1	HSCG-1
Macroinvertebrate community										
Date (yymmdd)	98/99	990615	990601	990602	990601	990511	990511	990511	990511	990505
# EPT families	11/10	9	10	6	6	7	8	9	8	6
Assessment	G/G	G	G	F	F	G	G	G	G	G
Fish community										
	990419	990825			990825					990707
Time (min)	30	30			30					30
Richness measures										
# species	18	19			11					20
# darter species	3	5			1					3
# minnow species	7	6			3					6
# species	3	4			2					6
# sucker species	0	0			1					0
# intolerant species	0	1			0					0
Composition measures										
% sunfish	12.4	4.9			23.9					13.6
% omnivores and herbivores	4.1	2			6.5					0
% insectivourous cyprinids	58.8	73.5			45.7					40.3
% top carnivores	2.1	0.98			0					2.6
Population measures										
Individuals	97	102			46					191
# collected per hour	194	204			92					382
% disease and anomalies	4.1	5.9			2.2					8.4
IBI Score	40	42			32					42
Biological Condition	F	F			P					F

* Reference Station

** 303(d) Station

^ Southeast Alabama Industry Impact Study Station

Table 8c. List of previous water quality assessments (by basin) conducted on streams within the Choctawhatchee River basin from 1993-1999. Chemical assessments are indicated when biological assessments were not conducted.

Waterbody	*Date(s)*	*Assessment Type**	*Tables and Appendices* [+]
Upper Choctawhatchee River (03140201)			
010 E. Fork Choctawhatchee River	1993-1997	C	Poultry-AU, F-6c
020 E. Fork Choctawhatchee River	1993-1997, 1998, 1999	C, H, M	AUCE, T-6c, T-7c, F-4c, F-6c
050 Blue Spring	1998	C	F-3c
050 W. Fork Choctawhatchee River	1994-1996, 1998	C	F-3c, F-4c
070 W. Fork Choctawhatchee River	1994-1996, 1999	C, H	F-8c, F-9c
070 Tributary to W. Fork Choctawhatchee River	2000	C, H	F-8c, F-9c
080 Judy Creek	1998	C, H	F-8c, F-9c
090 L. Judy Creek	2000	C, H	F-8c, F-9c
100 Judy Creek	1998, 1999	C, H, M, F	T-6c, T-7c, F-6c
110 Choctawhatchee River	1994-1996	C	F-4c, F-10c
110 N. Fork Choctawhatchee River	1993-1997	C	AUCE
130 L. Choctawhatchee River	1996	C	F-10c
130 Bear Creek	1995, 1996, 1998, 1999	C, H, M, F	T-6c, T-7c, F-1c, F-2c
130 Newton Creek	1999	C, H, M	T-6c, T-7c, F-5c
130 Beaver Creek	1999	C, H, M	T-6c, T-7c, F-5c
130 Sandy Branch	1997	C, H	F-8c, F-9c
130 L. Choctawhatchee River	1994-1996	C	F-4c
130 Hurricane Creek	1994-1996	C	F-4c
140 Pea River	1994-1996	C	F-4c
140 L. Claybank Creek	1994-1996	C	F-4c
140 Claybank Creek	1994-1996	C	F-4c
160 Claybank Creek	1994-1996	C	F-4c, F-10c
170 Harrand Creek	1999	C, H, M	T-6c, T-7c, F-5c
170 Tributary to Harrand Creek	1999	C	F-5c
210 Choctawhatchee River	1996	C	F-10c
210 Wilkerson Creek	1994-1996	C	F-4c
210 Wilson Creek	1994-1996	C	F-4c
220 Choctawhatchee River	1994-1996	C	F-4c
220 Providence Creek	1994-1996	C	F-4c
230 Blanket Creek	1994-1996	C	F-4c, F-10c
230 Double Bridges Creek	1994-1995	C	F-4c, F-10c
230 L. Double Bridges Creek	1994-1995	C	F-4c
240 Tight Eye Creek	1994-1995	C	F-4c
250 Double Bridges Creek	1994-1995, 1996	C	F-4c, F-10c
250 L. Beaverdam Creek	1993-1997	C	

Table 8c. cont., List of previous water quality assessments (by basin) conducted on streams within the Choctawhatchee River basin from 1993-1999. Chemical assessments are indicated when biological assessments were not conducted.

Waterbody	*Date(s)*	*Assessment Type**	*Reference+*
Pea River (03140202)			
010 Double Creek	1998	C, H	F-8c, F-9c
010 Dry Creek	1995, 1999	C, H, M, F	T-6c, T-7c, F-1c, F-2c
010 Big Sandy Creek	1994-1996	C	F-4c
010 Pea River	1994-1996	C	F-4c
010 Conner's Creek	1994-1996	C	F-4c
020 Pea River	1996	C	F-10c
020 Stinking Creek	1994-1996	C	F-4c
030 Pea River	1998-1999	C	F-6c
030 Buckhorn Creek	1994	C	F-4c
030 Richland Creek	1994	C	F-4c
030 Sandy Run Creek	1994	C	F-4c
040 Clearwater Creek	1994, 1998-1999	C	F-4c, F-6c
040 Pea River	1993-1997	C	AUCE, F-4c
040 Bowden Mill Creek	1994	C	F-4c
040 Halls Creek	1994	C	F-4c
050 Tributary to Whitewater Creek	1997	C, H	F-8c, F-9c
050 Whitewater Creek	1994, 1999	C, H	F-4c, F-8c, F-9c
060 Walnut Creek	1994-1996	C	F-4c
060 Tributary to Walnut Creek	1999	C, H	F-8c, F-9c
070 Mims Creek	1994	C	F-4c
070 Whitewater Creek	1994-1996, 1998-1999	C, H, M, F	T-6c, T-7c F-4c, F-6c
080 Big Creek	1994-1996, 1999	C	F-4c, F-5c
080 Cowpen Creek	1999	C, H, M	T-6c, T-7c, F-4c, F-5c
080 Fishpond Creek	1999	C	F-5c
080 Sweetwater Creek	1999	C	F-5c
090 Pea Creek	1994	C	F-4c
090 Pea River	1994-1996	C	F-4c
100 Beaverdam Creek	1994	C	F-4c
100 Pea River	1996	C	F-10c
100 Cripple Creek	1996	C	F-10c
100 Phillips Creek	1999	C, H	F-8c, F-9c
100 Patrick Creek	1995, 1999	C, H, M, F	T-6c, T-7c, F-1c, F-2c
140 Sandy Creek	1996	C	F-10c
140 Tributary to Sandy Creek	2000	C, H	F-8c, F-9c
Lower Choctawhatchee River (03140203)			
Spring Creek Co. Rd. 4 E of Eunola	1996	C	F-10c

* C=Chemical; H=Habitat; M=Macroinvertebrate; F=Fish

\+ T=tables; F=appendices

Table 9c. Summary of the number of current construction/stormwater authorizations and NPDES permits issued within the Choctawhatchee and Pea River basins. Those subwatersheds with more than five authorizations or permits in a category are in bold.

Cataloging Unit and Subwatershed	# of Authorizations / #NPDES permits					
	Total Number of Permits and Authorizations	Construction/ Stormwater Authorizations[c]	Mining NPDES[a]	Municipal NPDES[b]	Semi Public/ Private NPDES[b]	Industrial Process Wastewater - NPDES Majors[b]
Upper Choctawhatchee River (0314-0201)						
010	***45***	**2**	**43**			
020	*5*	3				2
030	*3*	1				2
040	*5*	4	1			
050	*3*	2				1
060	*1*	1				
070	*1*			1		
080	*3*	2	1			
090	*2*	2				
100	*0*					
110	*10*	3	2	2		3
120	*2*			2		
130	***40***	**30**	**6**	**4**		
140	***10***	**8**				**2**
150	*3*	3				
160	*5*	2		1		2
170	***14***	**12**	**1**	**1**		
180	*3*	2		1		
190	*1*	1				
200	*1*	1				
210	*4*	4				
220	*4*	3	1			
230	*8*	5		2		1
240	*2*	2				
250	*2*	2				

Table 9c. cont., Summary of the number of current construction/stormwater authorizations and NPDES permits issued within the Choctawhatchee and Pea River basins. Those subwatersheds with more than five authorizations or permits in a category are in bold.

Cataloging Unit and Subwatershed	# of Authorizations / #NPDES permits					
	Total Number of Permits and Authorizations	Construction/ Stormwater Authorizations[c]	Mining NPDES[a]	Municipal NPDES[b]	Semi Public/ Private NPDES[b]	Industrial Process Wastewater - NPDES Majors[b]
Pea River (0314-0202)						
010	*3*	3				
020	*2*	2				
030	*5*	5				
040	*5*	4				1
050	*1*	1				
060	*5*	4			1	
070	*3*	3				
080	*5*	5				
090	*1*	1				
100	***72***	**70**		**2**		
110	*5*	5				
130	*5*	4	1			
140	*3*	3				
Lower Choctawhatchee River (0314-0203)						
010	*3*	3				
050	*1*	1				
130	*1*	1				

Table 10c. List of stations assessed within the Choctawhatchee and Pea River basins as part of the NPS screening assessment.

Stream	Station	Sub-watershed	County	T	R	S	Sub-Ecoregion **	Basin Area (mi^2)	Assessment Type*
Upper Choctawhatchee (0314-0201)									
Deal Creek	DLCH-1	020	Henry	6N	26E	35	65d	10	C,H,M,F
Jack Creek	JKCH-1	020	Henry	7N	27E	30	65d	6	C,H,M,F
Panther Creek	PRCH-1	020	Henry	7N	26E	26	65d	12	C,H,M,F
Seabes Creek	SSCD-1	020	Dale	5N	26E	19	65d	7	C,H,M,F
Big Creek	BGCD-1	070	Dale	5N	25E	10	65d	8	C,H,M,F
Middle creek	MECD-1	070	Dale	5N	25E	15	65d	4	H,M
Walnut Creek	WTCD-1	070	Dale	6N	26E	6	65d	4	C,H,M,F
Blacks Creek	BLCD-1	080	Dale	7N	24E	16	65d	8	C,H,M,F
Judy Creek	JDYD-2	080	Dale	7N	24E	1	65d	51	C,H,M,F
Adams Creek	ASCG-1	220	Geneva	2N	22E	33	65g	8	H,M
Campbell Creek	CMCG-1	220	Geneva	2N	22E	14	65g	7	H,M
Tight Eye Creek	TECC-2	240	Coffee	3N	20E	26	65g	14	H,M
Pea (0314-0202)									
Big Sandy Creek	BSCB-1	010	Bullock	11N	24E	9	65d	17	H,M
Johnson Creek	JHCB-1	010	Bullock	12N	25E	17	65d	15	H,M
Whitewater Creek	WWCC-3	070	Coffee	7N	21E	5	65d	123	C,H,M,F
Whitewater Creek	WWCC-4	070	Coffee	6N	20E	10	65d	160	H,M
Flat Creek	FTCG-2	110	Geneva	1N	19E	10	65g	88	H,M
Flat Creek	FTCG-3	110	Geneva	2N	19E	4	65g	19	H,M
Panther Creek	PRCG-1	110	Geneva	2N	19E	19	65g	26	H,M
Sandy Creek	SYCG-1	140	Geneva	1N	21E	20	65g	25	H,M
Lower Choctawhatchee (0314-0203)									
Holmes Creek	HSCG-1	130	Geneva	1N	25E	25	65g	6	C,H,M,F

* Assessment Type: C=Chemical Assessment; H= Habitat Assessment; M=Aquatic Macroinvertebrate; F=Fish Assessment
** Level IV Ecoregions of Alabama (Griffith, et.al. 1999)

Table 11c. List of the four (4) waterbodies within the Choctawhatchee River Basin on ADEM's 2000 §303(d) list. Nonpoint sources and causes of impairment are listed (ADEM 1999c).

Waterbody	Sub-watershed	Miles impaired	Use	Support Status	Nonpoint Sources	Causes of Impairment
Upper Choctawhatchee River (0314-0201)						
Hurricane Creek	110		F&W	Unk.	Unknown source(s)	Pathogens
Dowling Branch	130		F&W	Unk.	Unknown source(s)	OE/DO; Pathogens
UT to Harrand Creek	150	4	F&W	Partial	Unknown source(s)	Nutrients; OE/DO
Pea River (0314-0202)						
Walnut Creek	060		F&W	Unk.	Municipal	Unknown toxicity
Cowpen Creek	080		F&W	Unk.	Unknown source(s)	pH

Table 12b. Land Use Percentages from EPA Landuse data layers (EPA 1997) and local Soil and Water Conservation District (SWCD) Conservation Assessment Worksheets (ASWCC 1998).

Cataloging Unit	Basin Area (mi^2)	Source	*Percent Total Landuse*						
			Open Water	Urban	Mining	Forest	Pasture/ Hay	Row Crops	Other
Lake Harding (0313-0002)	561	EPA	2	2	<1	80	7	4	5
		SWCD	*4*	*5*		*82*	*8*	*1*	
W.F. George (0313-0003)	1,425	EPA	2	1	<1	81	3	8	4
		SWCD	*2*	*5*		*73*	*10*	*7*	*2*
Lower Chattahoochee (0313-0004)	586	EPA	<1	1	<1	52	16	25	6
		SWCD	*1*	*3*	*1*	*47*	*14*	*33*	*2*
Chipola (0313-0012)	258	EPA	1	1		29	22	33	14
		SWCD	*1*	*10*		*35*	*18*	*35*	*2*
Yellow (0314-0103)	507	EPA	1	1		47	10	15	5
		SWCD	*1*	*3*		*72*	*12*	*11*	*1*
Blackwater (0314-0104)	148	EPA	<1			89	4	5	1
		SWCD	*1*			*80*	*7*	*10*	*1*
Perdido (0314-0106)	670	EPA	<1	1		65	15	10	9
		SWCD		*5*		*73*	*3*	*16*	*3*
Perdido Bay (0314-0107)	171	EPA	20	2	4	31	21	8	15
		SWCD	*9*	*16*		*52*	*3*	*15*	*5*

* The sum of total Landuse for each cataloging unit may range from 99% to 101% due to rounding.

Table 12b. cont., Land Use Percentages from EPA Landuse data layers (EPA 1997) and local Soil and Water Conservation District (SWCD) Conservation Assessment Worksheets (ASWCC 1998).

Cataloging Unit	Size sq. mi.	Source	*Percent Total Landuse*						
			Open Water	Urban	Mining	Forest	Pasture/ Hay	Row Crops	Other
Upper Choctawhatchee (0314-0201)	1542	EPA	1	2		56	12	23	7
		SWCD	*1*	*5*		*47*	*14*	*29*	*3*
Pea (0314-0202)	1,452	EPA	1	1		67	9	16	6
		SWCD		*2*		*62*	*12*	*21*	*1*
Lower Choctawhatchee (0314-0203)	135	EPA	1	<1		34	21	32	11
		SWCD		*1*		*34*	*15*	*45*	*5*
Upper Conecuh (0314-0301)	839	EPA	1	<1		76	6	9	7
		SWCD	*1*	*2*		*76*	*8*	*11*	*2*
Patsaliga (0314-0302)	602	EPA	<1	<1		75	6	<1	8
		SWCD		*2*		*76*	*11*	*7*	*4*
Sepulga (0314-0303)	1,049	EPA	<1	<1		84	5	6	5
		SWCD		*2*		*84*	*7*	*6*	*1*
Lower Conecuh (0314-0304)	996	EPA	<1	<1	<1	82	6	6	6
		SWCD		*2*		*88*	*3*	*5*	*1*
Escambia (0314-0305)	363	EPA	<1	1	1	65	16	13	4
		SWCD		*3*	*2*	*67*	*4*	*21*	*3*

* The sum of total Landuse for each cataloging unit may range from 99% to 101% due to rounding.

Table 13c. Summary of NPS and other studies assessments in the Upper Choctawhatchee (03140201), Pea (03140202), and Lower Choctawhatchee (03140203).

Cataloging Unit and Subwatershed	Station	*Assessment*				Overall Assessment
		Habitat	*Macroinv.*	*Fish*	*Chemical*	
Upper Choctawhatchee (0314-0201)						
010	EFCB-1^		G		U	G
020	DLCH-1	E	F	VP	D	VP
020	JKCH-1	E	P	P	U	P
020	PRCH-1	E	P	P	U	P
020	SSCD-1	G	F	F	D	F
020	EFCD-2^	E	E/G		D	G
070	BGCD-1	E	F	F	U	F
070	MECD-1	E	F			F
070	WTCD-1	E	G	F	D	F
080	BLCD-1	E	P	F	U	P
080	JDYD-2	E	F	P	D	F
100	JDYD-1^	G	P/P	P	D	P
130	BRH-1*	E	G			G
130	BVC-2**	E	P			P
170	HDC-1**	E	F			F
170	HDC-2**	E	P			P
170	UTCH-1**	P	P			P
220	ASCG-1	G	F			F
220	CMCG-1	E	G			G
240	TECC-2	E	G			G
Pea (0314-0202)						
010	DRYB-1	E	P	P		P
010	BSCB-1	E	F			F
010	JHCB-1	G	F			F
030	PEAB-1^		G/F		D	F
040	CLWC-1^		F	F	D	F
070	WWCP-1^		G/G		D	G
070	WWCC-2^	E	G/G	F	D	F
070	WWCC-3	E	G	F	D	G
070	WWCC-4	E	G			G
080	UTBC-2**	E	F			F
100	PATC-1*	E	F	P		P
110	FTCG-2	E	G			G
110	FTCG-3	E	G			G
110	PRCG-1	E	G			G
140	SYCG-1	E	G			G
Lower Choctawhatchee (0314-0203)						
130	HSCG-1	E	G	F	D	F

* Reference Station

** 303(d) Station

^ Southeast Alabama Industry Impact Study Station

U Water quality problems were undetected during water chemistry sampling

D Water chemistry sampling detected a potential water quality problem

Table 14c. Priority listing of subwatersheds assessed as part of the Southeast Alabama Basin Nonpoint Source Monitoring Project.

Subwatershed Number	Subwatershed Name	Station Assessment (Mod. Imp. / Sev. Imp.)	Suspected cause(s)	Suspected nonpoint sources
Upper Choctawhatchee (0314-0201)				
020	Lower E. Fork Choctawhatchee	Sev. Imp	Nutrients, Organic Enrichment	Animal production operations, Sedimentation
070	Lower W. Fork Choctawhatchee	Mod. Imp	Unknown	Animal production operations, Mining
080	Upper Judy Creek	Mod. Imp	Nutrients, Organic Enrichment	Animal production operations, Mining
100	Lower Judy Creek	Sev. Imp	Nutrients, Organic Enrichment	Animal production operations
130	Little Choctawhatchee River	Sev. Imp	Nutrients, Organic Enrichment	Unknown NPS, Point Source
170	Harrend Creek	Sev. Imp	Nutrients, Organic Enrichment	Unknown NPS, Point Source
220	Choctawhatchee River	Mod. Imp	Unknown	Row Crops
Pea (0314-0202)				
010	Pea River	Mod. Imp	Sedimentation, Nutrients	Unknown
030	Buckhorn Creek	Mod. Imp	Nutrients, Organic Enrichment	Aquaculture Operations
040	Pea River	Mod. Imp	Sedimentation, Nutrients	Unknown
070	Whitewater Creek	Mod. Imp	Nutrients, Organic Enrichment	Mining
080	Big Creek	Mod. Imp	Organic enrichment	Mining
100	Pea River	Sev. Imp	Unknown	Animal production operations, Sedimentation
Pea (0314-0202)				
130	Holmes Creek	Mod. Imp	Unknown	Aquaculture Operations, Row Crops

APPENDICES

Appendix A-1c. Land use percentages for the Upper and Lower Choctawhatchee River cataloging units (0314-0201 and 0314-0203) and the Pea River (0314-0202) from EPA landuse subcategory data (EPA 1997).

	Percent Total Landuse (Category and Subcategory)													
	Open Water	Urban			Mining	Forest				Pasture/ Hay	Row Crops	Other		
Sub-watershed	Open Water	Low Intensity Residential	High Intensity Residential	High Intensity Commercial/ Industrial/ Transportation	Quarries/ Strip Mines/ Gravel Pits	Transitional Forest	Deciduous Forest	Evergreen Forest	Mixed Forest	Pasture/ Hay	Row Crops	Other Grasses	Woody Wetlands	Herbaceous Wetlands
Upper Choctawhatchee (0314 - 0201)														
010	1	<1		<1	<1	<1	21	16	21	7	25	<1	8	<1
020	<1	<1	<1	<1		1	21	16	25	8	18	<1	10	<1
030	<1	<1	<1	1		<1	11	9	12	26	37	<1	3	<1
040	<1	<1	<1	<1		<1	15	15	19	19	28	1	2	<1
050	<1	<1	<1	<1		<1	24	14	22	8	25	<1	6	<1
060	<1	<1	<1	<1		<1	23	18	30	6	19		3	<1
070	<1	<1		<1		2	21	25	32	5	11	<1	4	<1
080	<1	<1		<1		1	23	21	32	5	14	<1	4	<1
090	<1	<1	<1	<1		<1	26	16	29	6	17	<1	5	<1
100	1	1	<1	<1		3	21	25	30	5	9	1	4	<1
110	1	2	<1	3		<1	18	22	30	5	14	2	3	<1
120	<1	1	<1	<1	<1	1	18	21	22	13	21	1	2	<1
130	1	2	<1	1	<1	<1	13	8	12	23	32	1	6	<1
140	1	1	<1	1		1	23	24	30	5	11	<1	3	<1
150	1	<1		1		3	20	28	35	4	7	<1	1	
160	<1	2	1	2		<1	13	26	21	8	15	4	8	<1
170	<1	8	2	3	<1	<1	15	18	24	8	16	3	3	<1

Appendix A-1c. cont., Land Use Percentages for Upper and Lower Choctawhatchee and Pea River Cataloging Units (0314-0202, 0314-0201, and 0314-0203) from EPA landuse subcategory data (EPA 1997).

	Percent Total Landuse (Category and Subcategory)													
	Open Water	Urban			Mining	Forest				Pasture/ Hay	Row Crops	Other		
Sub-watershed	Open Water	Low Intensity Residential	High Intensity Residential	High Intensity Commercial/ Industrial/ Transportation	Quarries/ Strip Mines/ Gravel Pits	Transitional Forest	Deciduous Forest	Evergreen Forest	Mixed Forest	Pasture/ Hay	Row Crops	Other Grasses	Woody Wetlands	Herbaceous Wetlands
Upper Choctawhatchee (0314 - 0201), Cont.														
180	<1	5	2	2	<1	<1	15	9	19	14	28	2	2	<1
190	1	<1					16	17	21	13	31		2	<1
200	<1	<1					11	6	8	15	59		1	<1
210	1	<1	<1	<1		<1	12	8	15	24	36	<1	4	<1
220	1	<1	<1	<1	<1	<1	16	13	17	16	23	<1	12	1
230	1	1	<1	<1		<1	12	14	21	15	29	1	6	<1
240	1	<1		<1	<1		13	7	18	23	34	<1	5	<1
250	1	<1	<1	<1	<1	<1	12	10	18	16	29	<1	13	<1
Pea River (0314 - 0202), Cont.														
010	<1	<1	<1	<1		3	27	22	26	3	11	<1	9	<1
020	<1	<1	<1	<1	<1	1	21	24	26	6	17	<1	5	<1
030	<1	<1	<1	<1	<1	2	21	16	28	9	17	<1	6	<1
040	<1	<1	<1	<1		2	20	18	32	7	16	<1	5	<1
050	1	<1	<1	<1	<1		21	12	20	16	23	<1	8	<1
060	1	2	<1	1	<1	<1	19	13	25	10	19	1	8	<1
070	<1	<1	<1	<1		1	22	15	32	7	15	<1	7	<1
080	1	<1	<1	<1		1	21	19	29	7	15	<1	7	<1
090	<1	<1	<1	<1		<1	18	31	38	4	6	<1	1	<1

Appendix A-1c. cont., Land Use Percentages for Upper and Lower Choctawhatchee and Pea River Cataloging Units (0314-0201, 0314-0202, and 0314-0203) from EPA landuse subcategory data (EPA 1997).

	Percent Total Landuse (Category and Subcategory)														
	Open Water	Urban			Mining	Forest				Pasture/ Hay	Row Crops	Other		
Sub-watershed	Open Water	Low Intensity Residential	High Intensity Residential	High Intensity Commercial/ Industrial/ Transportation	Quarries/ Strip Mines/ Gravel Pits	Transitional Forest	Deciduous Forest	Evergreen Forest	Mixed Forest	Pasture/ Hay	Row Crops	Other Grasses	Woody Wetlands	Herbaceous Wetlands
Pea River (0314 - 0202), Cont.														
100	1	<1	<1	<1	<1	<1	14	19	24	15	23	<1	3	<1
110	<1	<1	<1	<1		1	7	42	18	12	15	<1	3	<1
130	1	<1	<1	<1		<1	13	34	20	12	14	<1	5	1
140	1	1	<1	<1	<1	1	13	22	20	13	16	<1	12	1
Lower Choctawhatchee (0314 - 0203)														
010	1	<1	<1	<1	<1	<1	14	9	13	18	33	<1	10	1
050	1	<1	<1	<1		<1	13	6	11	24	32	<1	11	1
130	1	<1	<1	<1		<1	14	7	14	26	25		12	1

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EPA Region IV Land Cover Data Set
South-Central Portion

VERSION 1

INTRODUCTION

The main objective of this project was to generate a generalized and consistent (i.e. seamless) land cover data layer for the South-central portion of EPA Region IV, which includes most of Alabama, Western Georgia, Eastern Mississippi, and the Florida Panhandle. This data set was developed by personnel at the EROS Data Center (EDC), Sioux Falls, SD. The project was initiated during the summer of 1997, and a first draft product was completed in November, 1997 (Version 1). The write-up that follows pertains to Version 1. Questions about the data set can be directed to Terry Sohl (EDC; email sohl@edcmail.cr.usgs.gov; telephone 605-594-6537).

GENERAL PROCEDURES

Data sources:

The primary source of data for this project was leaves-off (primarily spring) Landsat TM data, acquired in 1988, 1990, 1991, 1992 and 1993. While most of the leaves-off data sets were acquired in spring, a few were from late autumn due to the difficulties in acquiring cloud-free TM data. These data sets were referenced to Albers Conical Equal Area coordinates (see table 1). Additionally, leaves-on (summer) TM data sets were acquired and referenced. The south-central and north-central portions of Region IV were processed as one unit and later split for distribution purposes; in total, 40 TM scenes were analyzed. Data sets used are provided in Table 2. In addition, other intermediate scale spatial data were acquired and utilized. These included 3-arc second Digital Terrain Elevation Dataset (DTED) and derivative DTED products (slope, shaded relief, and relative elevation), population density and housing units density data at the census block level, USGS land use and land cover data (LUDA), National Wetlands Inventory (NWI) data, and STATSGO soils information (available water and organic carbon).

Methods:

The general procedure of this project was to (1) mosaic multiple spring TM scenes and classify them using an unsupervised classification algorithm, (2) interpret and label classes into sixteen land cover categories using aerial photographs as reference data, (3) resolve confused classes using the appropriate ancillary data source(s), and (4) incorporate land cover information from leaves-on TM data, NWI data, and other data sources to refine and augment the "basic" classification developed above.

The entire area (north-central and south-central portions of Region IV) was analyzed as one large mosaic consisting of 20 leaves-off scenes. For mosaicking purposes, a base scene was selected, and other scenes were normalized to mimic spectral properties of the base scene following histogram equalization using pixels in regions of spatial overlap.

Following mosaicking, mosaicked scenes were clustered into 100 spectrally distinct classes using the Cluster algorithm developed by Los Alamos [1]. Clusters were assigned into

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Anderson level 1 and 2 land cover classes using National High Altitude Photography program (NHAP) aerial photographs as reference information. Almost invariably, individual spectral classes were confused between/among two or more "targeted" land cover classes. Separation of spectral classes into meaningful land cover units was accomplished using ancillary data. Briefly, for a given confused spectral class, digital values of the various ancillary data layers were compared to determine: (1) which data layers were the most effective for splitting the confused class into the appropriate land cover units, and (2) the appropriate thresholds for splitting the classes. Models were then developed using one to several data sets to split each confused class into the desired land cover categories. As an example, a spectral class might be confused between row crop and high-intensity residential areas. In order to split this particular class into more meaningful land cover units, population density and housing units density data were assessed to determine if they could be used to split the class into the respective categories, and if so, to define the appropriate thresholds to be used in the class splitting model.

Following the above class splitting steps, a "first order" classification product was constructed from the clustered leaves-off data. Leaves-on data were then clustered with the goal of refining certain land cover features not easily discriminated using leaves-off TM data. Land cover classes that were spatially but not spectrally distinct in the leaves-off data (barren areas, clearcuts) were digitized off the screen from the leaves-on data. These digitized data layers were used in conjunction with clustered leaves-on data to define barren and cleared areas which were then incorporated into the classification product. A digitized layer outlining wetland areas was also used to refine the wetlands information. "Other grasses", consisting largely of parks, urban lawns, and golf courses, were defined at this point by using hand-digitized information and LUDA urban information to separate "other grasses" from "hay/pasture". Similarly, high-intensity residential and high-intensity commercial/industrial areas were separated by using a threshold in the population density data.

The resulting classification (Version 1) includes the following. Please note not all classes were used for this region:

Water
- 11 Open Water
- 12 Perennial Ice/Snow

Developed
- 21 Low Intensity Residential
- 22 High Intensity Residential
- 23 High Intensity Commercial/Industrial/Transportation

Barren
- 31 Bare Rock/Sand
- 32 Quarries/Strip Mines/Gravel Pits
- 33 Transitional

Natural Forested Upland (non-wet)
- 41 Deciduous Forest
- 42 Evergreen Forest
- 43 Mixed Forest

Natural Shrubland

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51 Deciduous Shrubland
52 Evergreen Shrubland
53 Mixed Shrubland

Non-Natural Woody
61 Planted/Cultivated (orchards, vineyards, groves)

Herbaceous Upland Natural/Semi-Natural Vegetation
71 Grassland/Herbaceous

Herbaceous Planted/Cultivated
81 Pasture/Hay
82 Row Crops
83 Small Grains
84 Bare Soil
85 Other Grasses (Urban/recreational; e.g. parks, lawns, golf courses)

Wetlands
91 Woody Wetlands
92 Herbaceous Wetlands

Current definitions of the classes are as follows; percentages given must be viewed as guidelines.

Water - All areas of open water or permanent ice/snow cover

11. Water - all areas of open water, generally with less than 25% cover of vegetation/land cover.

12. Perennial Ice/Snow - all areas characterized by year-long surface cover of ice and/or snow.

Developed - areas characterized by high percentage (approximately 30% or greater) of construction materials (e.g. asphalt, concrete, buildings, etc).

21. Low Intensity Residential - Land includes areas with a mixture of constructed materials and vegetation or other cover. Constructed materials account for 30-80 percent of the total area.

These areas most commonly include single-family housing areas, especially suburban neighborhoods. Generally, population density values in this class will be lower than in high intensity residential areas.

22. High Intensity Residential - Includes heavily built-up urban centers where people reside.

Examples include apartment complexes and row houses. Vegetation occupies less than 20 percent of the landscape. Constructed materials account for 80-100 percent of the total area. Typically, population densities will be quite high in these areas.

23. High-Intensity Commercial/Industrial/Transportation - Includes all highly developed lands not classified as High Intensity Residential, most of which is Commercial/Industrial/Transportation.

Barren - Bare rock, sand, silt, gravel, or other earthen material with little or no vegetation regardless of its inherent ability to support life. Vegetation, if present, is more widely spaced and scrubby than that in the vegetated categories.

31. Bare Rock / Sand - Includes areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, and other accumulations of rock without vegetative cover.

32. Quarries / Strip Mines / Gravel Pits - Areas of extractive mining activities with significant surface expression.

33. Transitional - Areas dynamically changing from one land cover to another, often because of land use activities. Examples include forest lands cleared for timber, and may include both freshly cleared areas as well as areas in the earliest stages of forest regrowth.

Natural Forested Upland (non-wet) - A class of vegetation dominated by trees generally forming > 25 percent canopy cover.

41. Deciduous Forest - Areas dominated by trees where 75 percent or more of the tree species shed foliage simultaneously in response to an unfavorable season.

42. Evergreen Forest - Areas dominated by trees where 75 percent or more of the tree species maintain their leaves all year. Canopy is never without green foliage.

43. Mixed Forest - Areas dominated by trees where neither deciduous nor evergreen species represent more than 75 percent of the cover present.

Natural Shrubland - A class of vegetation defined by areas dominated by shrubs generally less than 6 meters tall with individuals or clumps not touching to interlocking. The species may include true shrubs or trees and shrubs that are small or stunted because of environmental conditions. Shrub canopy cover is generally greater than 25 percent when tree canopy is less than 25 percent. Shrub cover may be less than 25 percent if cases when the cover of each other life form (herbaceous, tree) is less than 25 percent and shrubs exceed the cover of the other life forms. Not currently represented in the central portion of the EPA Region IV data set.

51. Deciduous Shrubland - Areas dominated by shrubs where 75 percent or more of the shrub species shed foliage simultaneously in response to an unfavorable season.

52. Evergreen Shrubland - Areas dominated by shrubs where 75 percent or more of the shrub species maintain their leaves all year. Canopy is never without green foliage.

53. Mixed Shrubland - Areas dominated by shrubs where neither deciduous or evergreen species represent more than 75 percent of the cover present.

Non-Natural Woody - Areas dominated by non-natural woody plant species such as orchards, vineyards, and groves. The classification of Non-Natural Woody is subject to availability of sufficient ancillary data to differentiate from natural woody vegetation. Not currently represented in the central portion of the EPA Region IV data set.

61. Planted / Cultivated - Orchards, Vineyards, and tree plantations planted for the production of fruit, nuts, fiber (wood), or ornamental.

Herbaceous Upland Natural/Semi-Natural Vegetation - Areas comprised of natural or semi-natural upland herbaceous vegetation.

71. Grassland/Herbaceous - A class of vegetation dominated by natural upland grasslands, i.e. neither planted or cultivated by humans, as well as other non-woody

plants known as herbs (graminoids, forbs, and ferns). The grasses/herbs generally form at least 25 percent cover. Trees and shrubs generally have less than 25 percent cover. In rare cases, herbaceous cover is less than 25 percent but exceeds the combined cover of other life forms present.

Herbaceous Planted / Cultivated - Areas dominated with vegetation which has been planted in its current location by humans, and/or is treated with annual tillage, a modified conservation tillage, or other intensive management or manipulation. The majority of vegetation in these areas is planted and/or maintained for the production of food, feed, fiber, or seed.

81. Pasture / Hay - Grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops.

82. Row Crops - All areas used for the production of crops, such as corn, soybeans, vegetables, tobacco, and cotton.

83. Small Grains - All areas used for the production of graminoid crops such as wheat and rice. Not represented in the central portion of the EPA Region IV data set.

84. Bare Soil - Areas within planted or cultivated regions that have been tilled or plowed and do not exhibit any visible cover of vegetation. Not represented in the central portion of the EPA Region IV data set.

85. Other Grasses - Vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes. Examples include parks, lawns, and golf courses.

Wetlands - Non-woody or woody vegetation where the substrate is periodically saturated with or covered with water as defined by Cowardin et al. [2].

91. Woody Wetlands - Areas of forested or shrubland vegetation where the soil or substrate is periodically saturated with or covered with water as defined by Cowardin et al. [2].

92. Emergent Woodlands - Non-woody vascular perennial vegetation where the soil or substrate is periodically saturated with or covered with water as defined by Cowardin et al. [2].

CAVEATS AND CONCERNS

While we believe that the approach taken has yielded a very good general land cover classification product for a very large region, it is important to indicate to the user where there might be some potential problems. The biggest concerns are listed below:

1) Quantitative accuracy checks have yet to be conducted. We plan to make comparisons with existing data sets in order to develop a general overview regarding the quality of the land cover data set developed. Feedback from users of the data will be greatly appreciated.

2) Some of the leaves-off data sets were not temporally ideal. In this project, leaves-off data sets are heavily relied upon for discriminating between hay/pasture and row crop, and also for discriminating between forest classes. The success of discriminating between these classes

using leaves-off data sets hinges on the time of data acquisition. When hay/pasture areas are non-green, they are not easily distinguishable from other agricultural areas using remotely sensed data. However, there is a temporal window during which hay and pasture areas green up before most other vegetation (excluding evergreens, which have different spectral properties); during this window these areas are easily distinguishable from other crop areas. The discrimination between evergreen and deciduous forest is likewise optimized by selecting data in a temporal window where deciduous vegetation has yet to leaf out. Due to double-cropping practices and the long-growing season in this portion of the country, it's difficult to acquire a single-date of imagery that adequately differentiates between both deciduous/conifer and hay-pasture/row crop.

3) The data sets used cover a range of years, and changes that have taken place across the landscape over the time period may not have been captured. While this is not viewed as a major problem for most classes, it is possible that some land cover features change more rapidly than might be expected (e.g. hay one year, row crop the next).

4) Wetlands classes are extremely difficult to extract from Landsat TM spectral information alone. The use of ancillary information such as National Wetlands Inventory (NWI) data is highly desireable. NWI data were not available in digital format for much of this area. Manual digitizing was used in combination with spectral information to derive much of the wetlands information, a procedure that isn't able to provide the level of detail of NWI data. It is suspected that forested wetlands are underestimated in areas where NWI wasn't available.

5) Accurate definition of the transitional barren class was extremely difficult. The majority of pixels in this class correspond to clear-cut forests in various stages of regrowth. Spectrally, fresh clear-cuts are very similar to row-crops in the leaves-off data. Manual correction of coding errors was performed to improve differentiation between row-crops and clear-cuts, but some errors may still be found. As regrowth occurs in a clear-cut region, the definition of transitional barren verses a forested class becomes problematic. An attempt was made to classify only fresh clear-cuts or those in the earliest stages of regrowth, but there are likely forested regions classed as transitional barren and vice versa.

6) Due to the confusion between clear-cuts, regrowth in clear-cuts, forested areas, and shrublands, no attempts were made to populate the shrubland classes. Any shrubland areas that exist in this area are classed in their like forest class, i.e. deciduous shrubland is classed as deciduous forest, etc.

ACKNOWLEDGMENTS

This work was performed by the Hughes STX Corporation under U.S. Geological Survey Contract 1434-92-C-40004.

REFERENCE

Appendix A2c.

[1] Kelly, P.M., and White, J.M., 1993. Preprocessing remotely sensed data for efficient analysis and classification, Applications of Artificial Intelligence 1993: Knowledge-Based Systems in Aerospace and Industry, Proceedings of SPIE, 1993, 24-30.

[2] Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe, 1979. Classification of Wetlands and Deepwater Habitats of the United States, Fish and Wildlife Service, U.S. Department of the Interior, Washington, D.C.

Table 1. Projection Information

The initial Landsat TM mosaics, all ancillary data sets, and the final classification product are all map- registered to an Albers Conical Equal Area projection. The following represents projection information for the final classification product:

Projection: Albers Conical Equal Area
Datum: NAD83
Spheroid: GRS80
Standard Parallels: 29.5 degrees North Latitude
45.5 degrees North Latitude
Central Meridian: 96 degrees West Longitude
Origin of the Projection: 23 degrees North Latitude
False Easting: 0 meters
False Northing: 0 meters
Number of Lines: 17220 Number of Samples: 21773 Number of Bands: 1
Pixel size: 30 X 30 meters
Upper Left Corner: 591953 meters (X), 1301000 meters (Y)
Upper Right Corner: 1245113 meters (X), 1301000 meters (Y)
Lower Left Corner: 591953 meters (X), 784430 meters (Y)
Lower Right Corner: 1245113 meters (X), 784430 meters (Y)

Table 2. MRLC Landsat thematic mapper (TM) data sets used to develop north-central and south-central portions of the EPA Region IV data set.

No asterisk represents scenes used in south-central portion only
* Represents scenes used in north-central portion only.
** Represents scenes used in both the north-central and south-central portion

Path/Row	Date	EOSAT-ID
19/33	12/14/90	5019033009034810*
19/33	09/20/94	5019033009426310*
19/34	10/03/93	5019034009327610*

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19/34	11/20/93	5019034009332410*
19/35	11/12/90	5019035009031610*
19/35	09/30/92	5019035009227410*
19/36	09/28/91	5019036009127110**
19/36	11/17/92	5019036009232210**
19/37	03/09/93	5019037009306810
19/37	10/03/93	5019037009327610
19/38	02/16/91	5019038009104710
19/38	10/03/93	5019038009327610
19/39	02/16/91	5019039009104710
19/39	10/03/93	5019039009327610
20/33	08/02/91	5020033009121410*
20/33	11/22/91	5020033009132610*
20/34	11/29/88	5020034008833410*
20/34	08/02/91	5020034009121410*
20/35	11/29/88	5020035008833410*
20/35	10/07/92	5020035009228110*
20/36	03/11/91	5020036009107010**
20/36	07/22/93	5020036009320310**
20/37	11/29/88	5020037008833410
20/37	10/23/92	5020037009229710
20/38	02/10/92	5020038009204110
20/38	10/23/92	5020038009229710
20/39	01/22/91	5020039009102210
20/39	11/06/91	5020039009131010
21/34	04/05/92	5021034009209610*
21/34	10/14/92	5021034009228810*
21/35	04/05/92	5021035009209610*
21/35	08/30/93	5021035009324210*
21/36	09/10/91	5021036009125310**
21/36	12/15/91	5021036009134910**
21/37	02/03/93	5021037009303410
21/37	10/01/93	5021037009327410
21/38	02/14/91	5021038009104510
21/38	10/12/91	5021038009128510
21/39	09/26/91	5021039009126910
21/39	02/01/92	5021039009203210

APPENDIX B-1.

ADEM-FIELD OPERATIONS-ECOLOGICAL STUDIES
RIFFLE/RUN HABITAT ASSESSMENT FIELD DATA SHEET

Name of Waterbody _____ Date: _____
Station Number _____ Investigators _____

Habitat Parameter	Category			
	Optimal	Suboptimal	Marginal	Poor
1 **Instream Cover**	>50% mix of boulder, cobble, submerged logs, undercut banks, or other stable habitat.	50-30% mix of boulder, cobble, or other stable habitat; adequate habitat.	30-10% mix of boulder, cobble, or other stable habitat; habitat availability less than desirable.	<10% mix of boulder, cobble, or other stable habitat; lack of habitat is obvious.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2 **Epifaunal surface**	Well developed riffle and run; riffles as wide as stream and length extends 2x the width of stream; abundance of cobble.	Riffle is as wide as stream but length is <2 times width; abundance of cobble; boulders and gravel common.	Run area may be lacking; riffle not as wide as stream and its length is <2 times the stream width; gravel or large boulders and bedrock prevalent; some cobble present.	Riffles or run virtually non existent; large boulders and bedrock prevalent; cobble lacking.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3 **Embeddedness**	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble and boulder particles are >75% surrounded by fine sediment.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4 **Velocity/Depth Regimes**	All 4 velocity/depth regimes present (slow-deep, slow-shallow, fast-shallow, fast-deep).	Only 3 of 4 regimes present. (if fast-shallow is missing, score lower.)	Only 2 of 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime (usually slow-deep).
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5 **Channel Alteration**	No Channelization or dredging present.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (>20 years) may be present, but not recent.	New embankments present on both banks; and 40 - 80% of stream reach is channelized and disrupted.	Banks shored with gabion or cement; >80% of the stream reach channelized and disrupted.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6 **Sediment Deposition**	Little or no enlargement of islands or point bars and less than 5 % of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from coarse gravel; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel coarse sand on old and new bars; 30-50% of the bottom affected; sediment deposits at obstruction, constriction,, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; > 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7 **Frequency of Riffles**	Occurrence of riffles relatively frequent; distance between riffles divided by stream width equals 5-7; variety of habitat.	Occurrence of riffles relatively infrequent; distance between riffles divided by the stream width equals 7-15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided stream width is 15-25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by stream width >25.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8 **Channel flow Status**	Water reaches base of both lower banks and minimal amount t of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
9 **Condition of Banks**	Banks stable; no evidence of erosion or bank failure.	Moderately stable; infrequent, small areas of erosion mostly healed over.	Moderately unstable; up to 60% of banks in reach have areas of erosion.	Unstable; many eroded areas; "raw" areas frequent Along straight section and bends; on side slopes, 60-100% of bank has erosional scars.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
10 **Bank Vegetative Protection**	>90% of the stream bank surfaces covered by vegetation.	90-70% of the streambank surfaces covered by vegetation.	70-50% of the stream bank surfaces covered by vegetation.	<50% of the streambank surfaces covered by vegetation.
Score (LB) _____	10 9 8	7 6	5 4 3	2 1 0
Score (RB) _____	10 9 8	7 6	5 4 3	2 1 0
11 **Grazing or other disruptive pressure**	Vegetative disruption, through grazing or mowing, minimal or not evident; almost all plants allowed to grow naturally.	Disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	Disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Disruption of stream bank vegetation is very high; vegetation has been removed to 2 inches or less in average stubble height.
Score (LB) _____	10 9 8	7 6	5 4 3	2 1 0
Score (RB) _____	10 9 8	7 6	5 4 3	2 1 0
12 **Riparian vegetative zone (each bank)**	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone.	Width of riparian zone 18-12 meters; human activities have impacted zone only minimally.	Width of riparian zone 12-6 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters;: little or no riparian vegetation due to human activities.
Score (LB) _____	10 9 8	7 6	5 4 3	2 1 0
Score (RB) _____	10 9 8	7 6	5 4 3	2 1 0

APPENDIX B-2.

ADEM-FIELD OPERATIONS-ECOLOGICAL STUDIES
GLIDE/POOL HABITAT ASSESSMENT FIELD DATA SHEET

Name of Waterbody _____ Date: _____
Station Number _____ Investigators _____

Habitat Parameter	Category			
	Optimal	Suboptimal	Marginal	Poor
1 **Instream Cover**	> 50% mix of snags, submerged logs, undercut banks, or other stable habitat; rubble, gravel may be present.	50-30% mix of stable habitat; adequate habitat for maintenance of populations.	30-10% mix of stable habitat; habitat availability less than desirable.	<10% stable habitat; lack of habitat is obvious.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2 **Pool Substrate Characterization**	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant ; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3 **Pool Variability**	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4 **Channel Alteration**	No Channelization or dredging present.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (>20 years) may be present, but not recent.	New embankments present on both banks; channelization may be extensive, usually in urban or agriculture lands; and > 80% of stream reach is channelized and disrupted.	Extensive channelization; banks shored with gabion or cement; heavily urbanized areas; instream habitat greatly altered or removed entirely.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5 **Sediment Deposition**	<20% of bottom affected; minor accumulation of fine and coarse material at snags and submerged vegetation; little or no enlargement of islands or point bars.	20-50% affected; moderate accumulation; substantial sediment movement only during major storm event; some new increase in bar formation.	50-80% affected; major deposition; pools shallow, heavily silted; embankments may be present on both banks; frequent and substantial sediment movement during storm events.	Channelized; mud, silt, and/or sand in braided or non-braided channels; pools almost absent due to deposition.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6 **Channel Sinuosity**	Bends in stream increase stream length 3 to 4 times longer than if it was in a straight line.	Bends in stream increase stream length 2 to 3 times longer than if it was in a straight line.	Bends in stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7 **Channel flow Status**	Water reaches base of both lower banks and minimal amount t of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8 **Condition of Banks**	Banks stable; no evidence of erosion or bank failure; <5% affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% affected.	Moderately unstable; 30-60% of banks in reach have areas of erosion.	Unstable; many eroded areas; "raw" areas frequent Along straight section and bends; on side slopes, 60-100% of bank has erosional scars.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
9 **Bank Vegetative Protection (each bank)**	> 90% of the stream bank surfaces covered by vegetation.	90-70% of the streambank surfaces covered by vegetation.	70-50% of the stream bank surfaces covered by vegetation.	<50% of the streambank surfaces covered by vegetation.
Score (LB) _____	10 9 8	7 6	5 4 3	2 1 0
Score (RB) _____	10 9 8	7 6	5 4 3	2 1 0
10 **Grazing or other disruptive pressure (each bank)**	Vegetative disruption, through grazing or mowing, minimal or not evident; almost all plants allowed to grow naturally.	Disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	Disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Disruption of stream bank vegetation is very high; vegetation has been removed to 2 inches or less in average stubble height.
Score (LB) _____	10 9 8	7 6	5 4 3	2 1 0
Score (RB) _____	10 9 8	7 6	5 4 3	2 1 0
11 **Riparian vegetative zone Width (each bank)**	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone.	Width of riparian zone 18-12 meters; human activities have impacted zone only minimally.	Width of riparian zone 12-6 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
Score (LB) _____	10 9 8	7 6	5 4 3	2 1 0
Score (RB) _____	10 9 8	7 6	5 4 3	2 1 0

APPENDIX C.

ADEM-FIELD OPERATIONS-ECOLOGICAL STUDIES
PHYSICAL CHARACTERIZATION / WATER QUALITY FIELD DATA SHEET-Wadeable Streams

Station # _____ Date: _____ Collector Names _____

Reach Description: _____

WATERSHED CHARACTERISTICS

Watershed Land Use: Forest Pasture Ag. Residential Commercial Ind. Other: _____

Local Watershed Erosion: None Slight Moderate Heavy

Local Watershed NPS Pollution: No Evidence Potential sources Obvious Sources

REACH CHARACTERISTICS

Land Use at Reach: Pasture Crops Residential Forest Commercial Ind. Other: _____

Est. Stream Width: _____ ft *Depth:* Mid Channel _____ ft Riffle: _____ ft Run: _____ ft Pool: _____ ft

Length of Reach: _____ ft *Stream Gradient:* _____ ft drop in 25 feet (representative seg.) *Channelized:* Y N

Rosgen Stream Type: _____ *Bank Height:* _____ ft *High Water Mark:* _____ ft *Dam Present:* Y N

Prev. 7 day precip: Fl. Flood Heavy Mod. light none *Macrophytes:* None Rare Common Abundant

Canopy Cover: Open 0-20% Mostly Open 20-40% Est. 50/50 40-60% Mostly Shaded 60-80% Shaded 80-100% *Canopy Type:* _____

SEDIMENT / SUBSTRATE CHARACTERISTICS

Odors: Normal Sewage Petroleum Chemical Anaerobic Other: _____

Oils: Absent Slight Moderate Profuse

Deposits: Sludge Sawdust Paper-Fiber Sand Relict Shells Other: _____

Are the undersides of stones not deeply embedded, black? Y N N/A

WATER QUALITY CHARACTERISTICS

Water Odors: Normal Sewage Petroleum Chemical Other: _____

Water Surface Oils: None Slick Sheen Globs Flecks

Water Color: Clear Sl. Tannic Mod. Tannic Dk Tannic Green Gray Other: _____

Weather Conditions: Clear P/C Mostly Cloudy Cloudy Raining

Biological Indicators: Periphyton Macrophytes Fish Filamentous Slimes Others

PHOTOS Roll # _____

Picture # _____ Description _____ Picture # _____ Description _____

EST. % COMP. IN SAMPLING AREA

Inorganic + Organic = 100%

Type	Diameter	Percent
Bedrock		%
Boulder	>10 in.	%
Cobble	2.5 - 10 inches	%
Gravel	0.1 - 2.5 inches	%
Sand	gritty	%
Silt		%
Clay	slick	%
Detritus	Stick, Wood	%
	CPOM	%
Mud-Muck	fine organic	%
Marl	Gray Shell Frag.	%

FIELD NOTES

WATER QUALITY

Time _____ hrs (24hrs)

Mid Channel Depth _____ ft

Sample Depth _____ ft

T-Air _____ C

T-H2O _____ C

pH _____ s.u.

Cond. _____ umhos @ 25c

D.O. _____ mg/l

Turb. _____ ntu

Appendix D-1c. Results of physical/chemical measurements and water quality samples collected from NPS screening assessment stations located within the Choctawhatchee River CU.

Sub-Watershed Number	Station Number	Date (YYMMDD)	Time (24hr)	Water Temp. (C)	Dissolved Oxygen (mg/l)	pH (s.u.)	Conductivity (umhos)	Turbidity (ntu)	Flow (cfs)	Fecal Coliform (col/100ml)	BOD-5 (mg/l)	TSS (mg/l)	TDS (mg/l)	Alkalinity (mg/l)	Hardness (mg/l)	NH3-N (mg/l)	NO2/ NO3 (mg/l)	T-PO4 (mg/l)	TKN (mg/l)	TON (mg/l)	TOC (mg/l)
Upper Choctawhatchee (0314-0201)																					
020	DLCH-1	990520	1400	25.59	7.64	6.22	34	9.63	3.3												
020	DLCH-1	990715	0945	24.6	6.4	6.3	28	15.2	13	97	0.7	15	86	9	10.3	<MDL	0.07	0.12	0.33	0.33	7.47
020	JKCH-1	990519	1330	21.6	7.01	5.5	31	31	1.8												
020	JKCH-1	990715	1105	23	2.3	5.3	25	27	0	67	0.6	4	58	8	8.57	<MDL	0.06	0.07	<MDL	<MDL	8.59
020	PRCH-1	990519	1530	22.98	7.4	5.89	31	12.3	6.3												
020	PRCH-1	990715	1020	23	5.7	5.8	25	17	21	50	1	4	85	10	8.54	<MDL	0.19	0.03	<MDL	<MDL	5.3
020	SSCD-1	990512	1630	21.74	8.38	5.75	32	11.2	5.1												
020	SSCD-1	990714	1620	25	9.5	6.4	30	11.2	9	120	1.3	10	72	10	11.3	<MDL	0.28	0.06	<MDL	<MDL	5.69
070	BGCD-1	990513	0900	19	8.02	5.4	36	7.03	1												
070	BGCD-1	990714	1545	24.7	8.4	6.4	31	13.6	6	93	0.9	7	74	9	10.4	<MDL	0.13	0.05	<MDL	<MDL	7.05
070	MECD-1	990512	1750	20.98	8.15	5.45	22	24.7	2.1												
070	WTCD-1	990513	1120	19	9.57	5.7	32	32.7	6.8												
070	WTCD-1	990714	1505	23	8.8	6.7	32	34.6	9	440	1.1	29	94	10	11.5	<MDL	0.35	0.05	<MDL	<MDL	4.78
080	BLCD-1	990519	0945	19.9	7.32	5.64	27	31.9	2.2												
080	BLCD-1	990714	1355	23.6	6.6	6.5	36	20	0	1110	0.8	9	94	10	11.4	<MDL	0.08	0.04	0.6	<MDL	6.92
080	JDYD-2	990513	1420	21	8.52	5.73	38	13.2	20.5												
080	JDYD-2	990714	1420	24	6.9	6.7	44	27	20	90	1.2	14	86	15	17.2	<MDL	0.11	0.08	0.5	0.5	7.64
220	ASCG-1	990512	1000	19.69	7.71	6.57	121	5.06	3.6												
220	CMCG-1	990506	1400	22.03	7.9	6.71	129	4.43	7.8												
240	TECC-2	990526	1117	24	6.3	6.66	51.9	---	13.9												
Pea River (0314-0202)																					
010	BSCB-1	990603	1435	24	6.3	6.58	46	31.4	3.1												
010	JHCB-1	990603	---	24	5.4	7.06	162.7	30.5	1.6												
070	WWCC-3	990615	1115	25	6.8	7.84	233	11.2	24.9												
070	WWCC-3	990714	1310	24	7	7	103	24.3	100	83	0.9	10	106	32	32.8	<MDL	0.29	0.13	<MDL	<MDL	4.8
070	WWCC-4	990601	1330	28	8.8	7.65	168.6	7.47	54.9												
100	PRCG-1	990511	1340	20	7.9	5.88	39	2.94	7.6												
110	FTCG-2	990511	1600	22	7.51	6.09	58	5.74	26.3												
110	FTCG-3	990511	1045	21	7.08	6.04	71	6.76	9.4												
140	SYCG-1	990511	1800	23	7.65	6.08	54	4.68	8												

Appendix D-1c. Cont., Results of physical/chemical measurements and water quality samples collected from NPS screening assessment stations located within the Choctawhatchee River CU.

Sub-Watershed Number	Station Number	Date (YYMMDD)	Time (24hr)	Water Temp. (C)	Dissolved Oxygen (mg/l)	pH (s.u.)	Conductivity (umhos)	Turbidity (ntu)	Flow (cfs)	Fecal Coliform (col/100ml)	BOD-5 mg/l	TSS (mg/l)	TDS (mg/l)	Alkalinity (mg/l)	Hardness mg/l	NH3-N (mg/l)	NO2/ NO3 (mg/l)	T-PO4 (mg/l)	TKN (mg/l)	TON (mg/l)	TOC (mg/l)
Lower Choctawhatchee (0314-0203)																					
130	HSCG-1	990505	1300	23	8.82	6.86	168	3.59	1.5												
130	HSCG-1	990715	0815	24	5.7	6.6	62	13	12	162	1.5	2	108	20	23.8	<MDL	0.17	0.04	0.75	0.75	6.16

** - High Flow

Appendix D-2c. Results of water quality samples collected for metals, chloride, and sulfate analyses from NPS screening assessment stations located within the Choctawhatchee River CU.

Sub-Watershed Number	Station Number	Date (YYMMDD)	Time (24hr)	Al (mg/l)	Ca (mg/l)	Cu (mg/l)	Fe (mg/l)	Mg (mg/l)	Mn (mg/l)	Zn (mg/l)	As (mg/l)	Cl (mg/l)	SO4 (mg/l)
Upper Choctawhatchee (0314-0201)													
20	DLCH-1	990715	945	<MDL	2.36	<MDL	1.4	1.06	0.104	<MDL	<MDL	5.62	1.78
20	JKCH-1	990715	1105	<MDL	2.02	<MDL	4.74	0.856	0.16	<MDL	<MDL	4.91	1.77
20	PRCH-1	990715	1020	<MDL	1.77	<MDL	1.39	1	0.117	<MDL	<MDL	5.38	1.75
20	SSCD-1	990714	1620	<MDL	2.54	<MDL	1.41	1.2	0.044	<MDL	<MDL	6.03	1.92
70	BGCD-1	990714	1545	<MDL	2.39	<MDL	2.18	1.07	0.044	<MDL	<MDL	6.01	2.03
70	WTCD-1	990714	1505	<MDL	2.6	<MDL	1.63	1.21	0.036	<MDL	<MDL	5.64	2.43
80	BLCD-1	990714	1355	<MDL	2.76	<MDL	2.91	1.09	0.132	<MDL	<MDL	6.03	2.06
80	JDYD-2	990714	1420	<MDL	4.14	<MDL	2.78	1.66	0.142	<MDL	<MDL	5.94	1.96
130	BRH-1	990715	730	<MDL	3.58	<MDL	2.07	1.24	0.18	<MDL	<MDL	6.81	1.64
Pea (0314-0202)													
10	DRYB-1	990715	1325	<MDL	6.39	<MDL	2.18	1.01	0.13	<MDL	<MDL	5.67	4.46
70	WWCC-3	990714	1310	<MDL	10.3	<MDL	1.48	1.73	0.129	<MDL	<MDL	6.82	8.16
Lower Choctawhatchee (0314-203)													
130	HSCG-1	990715	815	<MDL	7.67	<MDL	1.16	1.14	0.129	<MDL	<MDL	6.45	2.39

Appendix E-1c. Description of stations located within the Choctawhatchee River basin CU.

Basin	CU	Sub-watershed	County	Station Number	Purpose	Waterbody Name	Station Description	T / R / S	Latitude	Longitude	Sub-ecoregion
0314	0201	010	Barbour	EFCB-001	SE Alabama Poultry Industry Impact Study	East Fork Choctawhatchee R	East Fork Choctawhatchee @ Hwy 131	9N/27E/20	31.74117	-85.35498	65d
0314	0201	020	Henry	CW04U2-7	ALAMAP 1998	East Fork Choctawhatchee R	East Fork of Choctawhatchee River approx. 10.6 miles upstream of confluence with Blackwood Creek.	6N/26E/36	31.44650	-85.39180	65d
0314	0201	020	Henry	DLCH-1	NPS Screening Station	Deal Cr.	Deal Creek @ Co. Rd. 62	6N/26E/35	31.45208	-85.40772	65d
0314	0201	020	Henry	EFC (AU005)	AUCE Basin Study	E Fk Choctawhatchee	AL Hwy 10 W of Abbeville	7N/27E/4	31.60750	-85.35778	65d
0314	0201	020	Dale	EFCD-002	SE Alabama Poultry Industry Impact Study	East Fork Choctawhatchee R	East Fork Choctawhatchee @ Co. Rd. 67	5N/26E/30	31.37310	-85.47716	65d
0314	0201	020	Henry	JKCH-1	NPS Screening Station	Jack Cr.	Jack Creek @ Co. Rd. 75	7N/27E/30	31.59149	-85.38273	65d
0314	0201	020	Henry	PRCH-1	NPS Screening Station	Panther Cr.	Panther Creek @ Co. Rd. 40	7N/26E/26	31.54617	-85.39748	65d
0314	0201	020	Dale	SSCD-1	NPS Screening Station	Seabes Cr.	Seabes Creek @ Co. Rd. 44 & 67	5N/26E/19	31.38898	-85.48096	65d
0314	0201	020	Henry	TSCP-11	Troy St. - Choc/Pea Basin Study	East Fork Choctawhatchee R	E. Fork Choctawhatchee River HWY 27	6N/27E/18	31.49389	-85.36889	65d
0314	0201	050	Barbour	BSPB001	State Parks Project	Blue Spring	Blue Spring upstream of the confluence with the West Fork Choctawhatchee River (in Blue Springs State Park)	8N/25E/23	31.66202	-85.50614	65d
0314	0201	050	Barbour	TSCP-21	Troy St. - Choc/Pea Basin Study	Blue Spring	Blue Spring St. Park	8N/25E/23	31.66250	-85.50528	65d
0314	0201	050	Barbour	TSCP-12	Troy St. - Choc/Pea Basin Study	West Fork Choctawhatchee R	W. Fork Choctawhatchee River HWY 10	8N/25E/14	31.66361	-85.50528	65d
0314	0201	050	Barbour	WCHB001	State Parks Project	West Fork Choctawhatchee R	Upstream of the Confluence with Blue Spring (in Blue Springs State Park)	8N/25E/23	31.66186	-85.50566	65d
0314	0201	050	Barbour	WCHB002	State Parks Project	West Fork Choctawhatchee R	Downstream of the Confluence with Blue Spring.	8N/25E/23	31.65674	-85.50703	65d
0314	0201	070	Dale	BGCD-1	NPS Screening Station	Big Cr.	Big Creek @ Co. Rd. 59	5N/25E/10	31.42215	-85.53071	65d
0314	0201	070	Dale	CW03U3-10	ALAMAP 1999	West Fork Choctawhatchee R	West Fork of Choctawhatchee River approx. 1/4 mile west of Dale Co. Rd. 59.	6N/ 25E/ 33	31.45430	-85.53660	65d
0314	0201	070	Dale	CW1A4-13	ALAMAP 2000	West Fork Choctawhatchee R, UT	Tributary to the West Fork of Choctawhatchee River	6N/ 25E/ S23	31.48740	-85.50810	65d
0314	0201	070	Dale	MECD-1	NPS Screening Station	Middle Cr.	Middle Creek @ Co. Rd. 59	5N/25E/15	31.41452	-85.52549	65d
0314	0201	070	Dale	TSCP-13	Troy St. - Choc/Pea Basin Study	West Fork Choctawhatchee R	W. Fork Choctawhatchee River Dale Co. Rd. 36	6N/25E/22	31.47528	-85.52861	65d
0314	0201	070	Dale	WTCD-1	NPS Screening Station	Walnut Cr.	Walnut Creek @ Co. Rd. 67	6N/26E/6	31.52833	-85.47849	65d

Appendix E-1c. cont., Description of stations located within the Choctawhatchee River basin CU.

Basin	CU	Sub-watershed	County	Station Number	Purpose	Waterbody Name	Station Description	T / R / S	Latitude	Longitude	Sub-ecoregion
0314	0201	080	Dale	BLCD-1	NPS Screening Station	Blacks Cr.	Blacks Creek @ unnamed Co. Rd. off Co. Rd.19	7N/24E/16	31.57896	-85.64953	65d
0314	0201	080	Dale	CW02U2-26	ALAMAP 1998	Judy Cr	Judy Creek approx. 7.5 miles upstream of confluence with Little Judy Creek.	7N/24E/10	31.59130	-85.62140	65d
0314	0201	080	Dale	CW03U2-34	ALAMAP 1998	Judy Cr	Judy Creek approx. 1.5 miles upstream of confluence with Little Judy Creek.	6N/24E/1	31.52830	-85.58690	65d
0314	0201	080	Dale	JDYD-2	NPS Screening Station	Judy Cr	Judy Creek @ Co. Rd. 15	7N/24E/1	31.52639	-85.58350	65d
0314	0201	090	Dale	CW4U4-38	ALAMAP 2000	Little Judy Cr	Little Judy Creek	7N/ 25E/ S31	31.54500	-85.57320	65d
0314	0201	100	Dale	JDYD-001	SE Alabama Poultry Industry Impact Study	Judy Cr	Judy Creek @ HWY 105	6N/25E/7	31.51340	-85.57350	65d
0314	0201	110	Dale	CHO08	CWS-1996	Choctawhatchee R	AL Hwy 12 east of Clayhatchee	3N/24E/18	31.23611	-85.68833	65d
0314	0201	110	Dale	NCH (AU002)	AUCE Basin Study	N Fk Choctawhatchee R	AL Hwy 123 N of Newton	4N/24E/2	31.35083	-85.61778	65d
0314	0201	110	Dale	TSCP-14	Troy St. - Choc/Pea Basin Study	Choctawhatchee R	Choctawhatchee River at Waterford Rec Area	4N/24E/1	31.34972	-85.59944	65d
0314	0201	130	Dale	CHO16	CWS-1996	Little Choctawhatchee R	Co. Rd. 9 south of Newton	3N/25E/5	31.26250	-85.57000	65g
0314	0201	130	Dale	CHO17	CWS-1996	Little Choctawhatchee R	Hwy 92 east of Daleville	3N/24E/5	31.26222	-85.66890	65d
0314	0201	130	Houston	BRH 001	Reference Sites	Bear Cr	Bear Creek @ unnamed Houston Co. Rd. in T3N,R25E, S28.	3N/25E/28	31.20780	-85.54630	65g
0314	0201	130	Houston	BVC 001	1999 303(d)	Newton Cr	Newton Creek @ US Hwy 84.	3N/25E/13	31.23860	-85.50260	65g
0314	0201	130	Houston	BVC 002	1999 303(d)	Beaver Cr	Beaver Creek @ Houston Co. Rd. 59.	3N/25E/24	31.21770	-85.48670	65g
0314	0201	130	Houston	BVC 003	1999 303(d)	Beaver Cr	Beaver Creek 1/4 mile upstream of WWTP outfall.	3N/26E/20	31.21740	-85.46660	65g
0314	0201	130	Houston	BVWW001	1999 303(d)	Beaver Cr WWTP outfall	Beaver Creek WWTP outfall	3N/26E/20	31.21830	-85.46630	65g
0314	0201	130	Geneva	CW02U1	ALAMAP 1997	Sandy Branch	Sandy Branch approx. 0.7 miles upstream of confluence with Hurricane Creek.	2N/24E/17	31.14640	-85.65530	65g
0314	0201	130	Houston	TSCP-15	Troy St. - Choc/Pea Basin Study	Little Choctawhatchee R	L. Choctawhatchee River at Houston Co. Rd. 59	3N/26E/7	31.24639	-85.48167	65g
0314	0201	130	Houston	TSCP-16	Troy St. - Choc/Pea Basin Study	Little Choctawhatchee R	L. Choctawhatchee River at HWY 123	4N/24E/35	31.27444	-85.61972	65g
0314	0201	130	Geneva	TSCP-17	Troy St. - Choc/Pea Basin Study	Hurricane Cr	Huricane Creek at Geneva Co. Rd. 41	2N/23E/1	31.17139	-85.69861	65g

Appendix E-1c. cont., Description of stations located within the Choctawhatchee River basin CU.

Basin	CU	Sub-watershed	County	Station Number	Purpose	Waterbody Name	Station Description	T / R / S	Latitude	Longitude	Sub-ecoregion
0314	0201	140	Geneva	TSCP-10	Troy St. - Choc/Pea Basin Study	Pea R	Pea River at HWY 27	1N/17W/30	31.02750	-85.88417	65g
0314	0201	140	Dale	TSCP-18	Troy St. - Choc/Pea Basin Study	Little Claybank Cr	Little Claybank Creek at HWY 231	6N/24E/29	31.45806	-85.66778	65d
0314	0201	140	Dale	TSCP-25	Troy St. - Choc/Pea Basin Study	Claybank Cr	Dale Co. 36	6N/23E/15	31.49311	-85.72917	65d
0314	0201	160	Dale	CHO01	CWS-1996	Claybank Cr	AL Hwy 248 south of Lowe Field	4N/23E/9	31.33639	-85.74611	65d
0314	0201	160	Dale	CHO02	CWS-1996	Claybank Cr	Co. Rd. 24 southwest of Daleville	4N/23E/27	31.28528	-85.73889	65d
0314	0201	160	Dale	TSCP-19	Troy St. - Choc/Pea Basin Study	Claybank Cr	Claybank Creek at HWY 134	4N/23E/21	31.30806	-85.74306	65d
0314	0201	170	Coffee	HCWW001	1999 303(d)	Harrand Cr WWTP	Harrand Creek WWTP Outfall	4N/22E/2	31.34310	-85.81010	65d
0314	0201	170	Dale	HDC 001	1999 303(d)	Harrand Cr	Harrand Creek @ Lowe Field Road.	4N/23E/9	31.33840	-85.74840	65d
0314	0201	170	Coffee	HDC 002	1999 303(d)	Harrand Cr	Harrand Creek @ Coffee Co. Rd. 702.	4N/22E/2	31.34530	-85.81470	65d
0314	0201	170	Coffee	UTHC001	1999 303(d)	Harrand Cr, UT to	Unnamed tributary to Harrand Creek @ Dixie Dr.; approx. 1.3 miles upstream of confluence with Harrand Creek.	4N/22E/10	31.33150	-85.82980	65g
0314	0201	210	Geneva	CHO09	CWS-1996	Choctawhatchee R	@ Geneva Co. Rd. 45 northeast of Geneva	2N/23E/7	31.15917	-85.78472	65g
0314	0201	210	Coffee	TSCP-47	Troy St. - Choc/Pea Basin Study	Wilkerson Cr	Coffee Co. 723	3N/22E/16	31.23143	-85.84323	65g
0314	0201	210	Coffee	TSCP-48	Troy St. - Choc/Pea Basin Study	Wilson Cr	Coffee Co. 719	3N/22E/14	31.23787	-85.82258	65g
0314	0201	220	Geneva	ASCG-1	NPS Screening Station	Adams Cr.	Adams Creek @ St. HWY 85	2N/22E/33	31.10808	-85.84540	65g
0314	0201	220	Geneva	CMCG-1	NPS Screening Station	Campbell Cr.	Campbell Mill Creek @ St. HWY 85	2N/22E/14	31.14479	-85.82430	65g
0314	0201	220	Geneva	TSCP-20	Troy St. - Choc/Pea Basin Study	Choctawhatchee R	Choctawhatchee River at HWY 52	1N/16W/21	31.04056	-85.85250	65g
0314	0201	220	Geneva	TSCP-38	Troy St. - Choc/Pea Basin Study	Providence Cr	Hwy 85 Geneva Co.	2N/22E/14	31.14524	-85.82421	65g
0314	0201	230	Coffee	CHO03	CWS-1996	Blanket Cr	Co. Rd. 622 southwest of Enterprise	4N/21E/26	31.30667	-85.88417	65g
0314	0201	230	Coffee	CHO04	CWS-1996	Double Bridges Cr	Co. Rd. 655 southwest of Enterprise	3N/21E/21	31.21306	-85.95750	65g
0314	0201	230	Coffee	TSDB-1	Troy St. - Choc/Pea Basin Study	Double Bridges Cr	Coffee Co. 537	4N/21E/14	31.32622	-85.91568	65g

Appendix E-1c. cont., Description of stations located within the Choctawhatchee River basin CU.

Basin	CU	Sub-watershed	County	Station Number	Purpose	Waterbody Name	Station Description	T / R / S	Latitude	Longitude	Sub-ecoregion
0314	0201	230	Coffee	TSDB-10	Troy St. - Choc/Pea Basin Study	Little Double Bridges Cr	Hwy. 134	4N/21E/17	31.31303	-85.96248	65g
0314	0201	230	Coffee	TSDB-11	Troy St. - Choc/Pea Basin Study	Little Double Bridges Cr	Coffee Co. 606	4N/21E/33	31.27263	-85.95873	65g
0314	0201	230	Coffee	TSDB-12	Troy St. - Choc/Pea Basin Study	Little Double Bridges Cr	Coffee Co. 636	3N/21E/4	31.25515	-85.95204	65g
0314	0201	230	Coffee	TSDB-18	Troy St. - Choc/Pea Basin Study	Unnamed Stream	Coffee Co. 537	4N/21E/33	31.34237	-85.93337	65g
0314	0201	230	Coffee	TSDB-2	Troy St. - Choc/Pea Basin Study	Double Bridges Cr	Coffee Co. 636	3N/21E/4	31.25513	-85.94719	65g
0314	0201	230	Coffee	TSDB-3	Troy St. - Choc/Pea Basin Study	Double Bridges Cr	Coffee Co. 661	3N/21E/29	31.19741	-85.96522	65g
0314	0201	230	Geneva	TSDB-4	Troy St. - Choc/Pea Basin Study	Double Bridges Cr	Geneva Co. 64	2N/21E/6	31.17071	-85.98013	65g
0314	0201	230	Coffee	TSDB-8	Troy St. - Choc/Pea Basin Study	Blanket Cr	New Bypass	4N/22E/24	31.29720	-85.88430	65g
0314	0201	230	Coffee	TSDB-9	Troy St. - Choc/Pea Basin Study	Little Double Bridges Cr	Coffee Co. 531	4N/21E/4	31.34853	-85.95525	65g
0314	0201	240	Coffee	TECC-2	NPS Screening Station	Tight Eye Cr.	Tight Eye Creek @ Co. Rd. 661	3N/20E/26	31.19907	-86.01215	65g
0314	0201	240	Coffee	TSDB-13	Troy St. - Choc/Pea Basin Study	Tight Eye Cr	Coffee Co. 636	3N/20E/2	31.25278	-86.01694	65g
0314	0201	240	Coffee	TSDB-14	Troy St. - Choc/Pea Basin Study	Tight Eye Cr	Coffee Co. 661	3N/20E/26	31.19972	-86.01278	65g
0314	0201	240	Geneva	TSDB-15	Troy St. - Choc/Pea Basin Study	Tight Eye Cr	Geneva Co. 79	2N/20E/13	31.14607	-85.99557	65g
0314	0201	250	Geneva	CHO05	CWS-1996	Double Bridges Cr	Co. Rd. 65 northwest of Geneva	2N/21E/33	31.09500	-85.95000	65g
0314	0201	250	Geneva	TSDB-16	Troy St. - Choc/Pea Basin Study	Little Beaverdam Cr	Just off Geneva Co. 75 (near Coffee Springs)	2N/21E/1	31.17459	-85.89933	65g
0314	0201	250	Geneva	TSDB-17	Troy St. - Choc/Pea Basin Study	Beaverdam Cr	Geneva Co. 21	2N/21E/22	31.12872	-85.92720	65g
0314	0201	250	Geneva	TSDB-5	Troy St. - Choc/Pea Basin Study	Double Bridges Cr	unnamed Geneva Co Rd east of Spears	2N/21E/18	31.14486	-85.98817	65g
0314	0201	250	Geneva	TSDB-6	Troy St. - Choc/Pea Basin Study	Double Bridges Cr	Geneva Co. 58	2N/21E/29	31.11730	-85.97678	65g
0314	0201	250	Geneva	TSDB-7	Troy St. - Choc/Pea Basin Study	Double Bridges Cr	Geneva Co. 65	2N/21E/33	31.09500	-85.95000	65g
0314	0202	010	Bullock	BSCB-1	NPS Screening Station	Big Sandy Cr.	Big Sandy Creek @ Co. Rd. 8	11N/24E/9	31.94260	-85.63755	65d

Appendix E-1c. cont., Description of stations located within the Choctawhatchee River basin CU.

Basin	CU	Sub-watershed	County	Station Number	Purpose	Waterbody Name	Station Description	T / R / S	Latitude	Longitude	Sub-ecoregion
0314	0202	010	Bullock	CW01U2-23	ALAMAP 1998	Double Cr	Double Creek approx. 7.2 miles upstream of confluence with Pea River.	11N/23E/14	31.93790	-85.74420	65d
0314	0202	010	Barbour	DRYB001	Ecoregional Reference Site Program	Dry Cr	Dry Creek@ AL Hwy 239.	11N/24E/14	31.93480	-85.61090	65d
0314	0202	010	Bullock	JHCB-1	NPS Screening Station	Johnson Cr.	Johnson Creek @ Co, Rd. 14	12N/25E/17	32.02099	-85.55812	65d
0314	0202	010	Bullock	TSCP-1	Troy St. - Choc/Pea Basin Study	Big Sandy Cr	Big Sandy Creek at Bullock Co. Rd. 8	11N/24E/9	31.94333	-85.63722	65d
0314	0202	010	Pike	TSCP-2	Troy St. - Choc/Pea Basin Study	Pea R	Pea River at Pike Co. Rd. 44	10N/24E/8	31.86639	-85.66882	65d
0314	0202	010	Pike	TSCP-27	Troy St. - Choc/Pea Basin Study	Conner's Cr	Off Pike Co. 97	10N/24E/30	31.82140	-85.68460	65d
0314	0202	020	Barbour	CHO06	CWS-1996	Pea R	AL Hwy 130 west of Louisville	9N/24E/5	31.78528	-85.66280	65d
0314	0202	020	Barbour	TSCP-3	Troy St. - Choc/Pea Basin Study	Stinking Cr	Stinking Creek at HWY 239	11N/25E/28	31.89639	-85.54111	65d
0314	0202	030	Barbour	PEAB-001	SE Alabama Poultry Industry Impact Study	Pea R	Pea River @ HWY 10	9N/28E/36	31.71453	-85.70666	65d
0314	0202	030	Pike	TSCP-23	Troy St. - Choc/Pea Basin Study	Buckhorn Cr	Hwy. 130	9N/23E/11	31.77780	-85.71910	65d
0314	0202	030	Pike	TSCP-24	Troy St. - Choc/Pea Basin Study	Buckhorn Cr	Pike Co. 38	10N/23E/28	31.81961	-85.74916	65d
0314	0202	030	Pike	TSCP-39	Troy St. - Choc/Pea Basin Study	Richland Cr	Pike Co. 81	9N/23E/17	31.76324	-85.76848	65d
0314	0202	030	Pike	TSCP-40	Troy St. - Choc/Pea Basin Study	Richland Cr	Hwy. 10 Pike Co.	9N/23E/28	31.72576	-85.74138	65d
0314	0202	030	Pike	TSCP-41	Troy St. - Choc/Pea Basin Study	Sandy Run Cr	Pike Co. 81	9N/23E/30	31.73282	-85.78419	65d
0314	0202	030	Pike	TSCP-42	Troy St. - Choc/Pea Basin Study	Sandy Run Cr	Hwy. 10 Pike Co.	9N/23E/29	31.72591	-85.76628	65d
0314	0202	040	Covington	CLWC-001	SE Alabama Poultry Industry Impact Study	Clearwater Cr	Clearwater Creek @ Co Rd 110	7N/22E/9	31.59760	-85.84736	65d
0314	0202	040	Dale	PEA (AU001)	AUCE Basin Study (AUCE 1999)	Pea R	Us Hwy 231 N of Ozark	7N/23E/7	31.58528	-85.79417	65d
0314	0202	040	Pike	TSCP-22	Troy St. - Choc/Pea Basin Study	Bowden Mill Cr	Pike Co. 73	8N/23E/32	31.62222	-85.76927	65d
0314	0202	040	Pike	TSCP-26	Troy St. - Choc/Pea Basin Study	Clearwater Cr	Pike Co. 59	8N/22E/26	31.64556	-85.82002	65d
0314	0202	040	Coffee	TSCP-29	Troy St. - Choc/Pea Basin Study	Halls Cr	Coffee Co. 114	6N/22E/6	31.51967	-85.87588	65d

Appendix E-1c. cont., Description of stations located within the Choctawhatchee River basin CU.

Basin	CU	Sub-watershed	County	Station Number	Purpose	Waterbody Name	Station Description	T / R / S	Latitude	Longitude	Sub-ecoregion
0314	0202	040	Coffee	TSCP-34	Troy St. - Choc/Pea Basin Study	Pea R	Coffee Co. 246	6N/21E/34	31.44512	-85.94225	65d
0314	0202	040	Coffee	TSCP-35	Troy St. - Choc/Pea Basin Study	Pea R	Coffee Co. Rd. 127	6N/22E/5	31.52129	-85.86853	65d
0314	0202	040	Coffee	TSCP-36	Troy St. - Choc/Pea Basin Study	Pea R	Coffee Co. 107	7N/22E/27	31.55081	-85.82978	65d
0314	0202	040	Dale	TSCP-4	Troy St. - Choc/Pea Basin Study	Pea R	Pea River at HWY 231	7N/23E/7	31.58528	-85.79417	65d
0314	0202	040	Coffee	TSCP-5	Troy St. - Choc/Pea Basin Study	Pea R	Pea River at Coffee Co. Rd. 147	6N/22E/5	31.52083	-85.86833	65d
0314	0202	050	Pike	CW01U1	ALAMAP 1997	Whitewater Cr, UT to	Tributary to Whitewater Creek approx. 1.2 miles upstream of confluence with Whitewater Ck.	9N/22E/32	31.71710	-85.85850	65d
0314	0202	050	Pike	CW02U3-26	ALAMAP 1999	Whitewater Cr	Whitewater Creek approx. 1/8 mile downstream of Pike Co. Rd. 65 crossing.	9N/22E/29	31.72910	-85.87150	65d
0314	0202	050	Pike	TSCP-45	Troy St. - Choc/Pea Basin Study	Whitewater Cr	Pike Co. 59	8N/21E/1	31.70530	-85.89227	65d
0314	0202	050	Pike	TSCP-46	Troy St. - Choc/Pea Basin Study	Whitewater Cr	Pike Co. 26	9N/22E/16	31.75388	-85.84740	65d
0314	0202	060	Pike	CW01U3-52	ALAMAP 1999	Walnut Cr, UT to	Tributary to Walnut Creek approx. 1/2 mile east of Pike Co. Rd. 63.	9N/21E/16	31.75370	-85.95100	65d
0314	0202	060	Pike	TSCP-43	Troy St. - Choc/Pea Basin Study	Walnut Cr	Pike Co. 32	10N/22E/30	31.81872	-85.89216	65d
0314	0202	060	Pike	TSCP-44	Troy St. - Choc/Pea Basin Study	Walnut Cr	U.S. 231	9N/21E/11	31.77374	-85.92443	65d
0314	0202	060	Pike	TSCP-6	Troy St. - Choc/Pea Basin Study	Walnut Cr	Walnut Creek at Pike Co. Rd. 59	9N/21E/26	31.72889	-85.92583	65d
0314	0202	070	Pike	TSCP-30	Troy St. - Choc/Pea Basin Study	Mims Cr	Pike Co. 59	8N/22E/8	31.68216	-85.86995	65d
0314	0202	070	Coffee	TSCP-8	Troy St. - Choc/Pea Basin Study	Whitewater Cr	Whitewater Creek at Coffee Co. Rd. 224	6N/20E/10	31.50611	-86.03194	65d
0314	0202	070	Covington	WWCC-002	SE Alabama Poultry Industry Impact Study	Whitewater Cr	Whitewater Creek at Coffee Co. Rd. 215 (old 60)	7N/21E/31	31.53849	-85.98239	65d
0314	0202	070	Coffee	WWCC-3	NPS Screening Station	Whitewater Cr	Whitewater Creek @ St. HWY. 167	7N/21E/5	31.58820	-85.94014	65d
0314	0202	070	Coffee	WWCC-4	NPS Screening Station	Whitewater Cr	Whitewater Creek @ Co. Rd. 224	6N/20E/10	31.50577	-86.03137	65d
0314	0202	070	Pike	WWCP-001	SE Alabama Poultry Industry Impact Study	Whitewater Cr	Whitewater Creek at Pike Co. Rd. 33	8N/21E/26	31.63680	-85.92423	65d
0314	0202	080	Coffee	TSCP-7	Troy St. - Choc/Pea Basin	Big Cr	Big Creek at Coffee Co. Rd. 342	6N/20E/5	31.52278	-86.05944	65d

Appendix E-1c. cont., Description of stations located within the Choctawhatchee River basin CU.

Basin	CU	Sub-watershed	County	Station Number	Purpose	Waterbody Name	Station Description	T / R / S	Latitude	Longitude	Sub-ecoregion
0314	0202	080	Coffee	UTBC001	1999 303(d)	Big Cr	Big Creek @ Coffee Co. Rd. 340; approx. 4.3 miles upstream of confluence with Whitewater Creek.	6N/20E/4	31.52300	-86.05890	65d
0314	0202	080	Coffee	UTBC002	1999 303(d)	Cowpen Cr	Cowpen Creek @ Coffee Co. Rd. 315; approx. 0.8 miles upstream of confluence with Big Creek.	7N/20E/27	31.55570	-86.03580	65d
0314	0202	080	Coffee	UTBC003	1999 303(d)	Sweetwater Cr	Sweetwater Creek @ Coffee Co. Rd. 304; approx. 1.1 miles upstream of confluence with Big Creek.	7N/20E/16	31.58480	-86.05450	65d
0314	0202	080	Coffee	UTBC004	1999 303(d)	Fishpond Cr	Fishpond Creek @ Coffee Co. Rd. 308; approx. 50 feet upstream of confluence with Big Creek.	7N/20E/3	31.61450	-86.03230	65d
0314	0202	090	Coffee	TSCP-31	Troy St. - Choc/Pea Basin Study	Pea Cr	Coffee Co. 330	6N/19E/3	31.51417	-86.12778	65d
0314	0202	090	Coffee	TSCP-9	Troy St. - Choc/Pea Basin Study	Pea R	Pea River at HWY 84	5N/20E/17	31.41278	-86.06222	65d
0314	0202	100	Coffee	CHO07	CWS-1996	Pea R	Coffee Co.Rd. 474 E of Kinston	3N/19E/15	31.23222	-86.14056	65g
0314	0202	100	Coffee	CHO10	CWS-1996	Cripple Cr	Co. Rd. 470 at Kinston	3N/19E/8	31.23944	-86.17333	65g
0314	0202	100	Coffee	CHO11	CWS-1996	Cripple Cr	Co. Rd. 473 east of Kinston	3N/19E/21	31.21083	-86.14778	65g
0314	0202	100	Coffee	CW2A4-14	ALAMAP 2000	Phillips Cr	Phillips Creek	4N/ 20E/28	31.29170	-86.04680	65g
0314	0202	100	Coffee	PATC001	Reference Sites	Patrick Cr	Patrick Creek @ Coffee Co. Rd. 368.	5N/19E/2	31.43840	-86.11210	65d
0314	0202	100	Geneva	PRCG-1	NPS Screening Station	Panther Cr.	Panther Creek @ unnamed Co. Rd. S19 T2N R19or20W	2N/19E/19	31.12136	-86.18706	65g
0314	0202	100	Coffee	TSCP-49	Troy St. - Choc/Pea Basin Study	Beaverdam Cr	Coffee Co. 353	6N/19E/22	31.47806	-86.14361	65d
0314	0202	110	Geneva	FTCG-2	NPS Screening Station	Flat Cr.	Flat Creek @ unnamed Co. Rd. E of Hacoda	1N/19E/10	31.06772	-86.12480	65g
0314	0202	110	Geneva	FTCG-3	NPS Screening Station	Flat Cr.	Flat Creek @ unnamed Co. Rd. S4 T2N R19W	2N/19E/4	31.16894	-86.15753	65g
0314	0202	140	Geneva	CHO14	CWS-1996	Sandy Cr	Co. Rd. 16 south of Samson	1N/20E/3	31.08361	-86.03944	65g
0314	0202	140	Geneva	CHO15	CWS-1996	Sandy Cr	Co. Rd. 65 east of Geneva	1N/21E/28	31.03639	-85.96667	65g
0314	0202	140	Geneva	CW3U4-26	ALAMAP 2000	Sandy Cr, UT to	Tributary to Sandy Creek	1N/ 20E/ S3	31.09070	-86.03840	65g
0314	0202	140	Geneva	SYCG-1	NPS Screening Station	Sandy Cr.	Sandy Creek @ Co. Rd. 4	1N/21E/20	31.03641	-85.96632	65g
0314	0203	010	Geneva	CHO12	CWS-1996	Spring Cr	Co. Rd. 61 north of Black	1N/23E/27	31.03056	-85.73500	65g

Appendix E-1c. cont., Description of stations located within the Choctawhatchee River basin CU.

Basin	CU	Sub-watershed	County	Station Number	Purpose	Waterbody Name	Station Description	T / R / S	Latitude	Longitude	Sub-ecoregion
0314	0203	010	Geneva	CHO13	CWS-1996	Spring Cr	Co. Rd. 4 east of Eunola	1N/22E/27	31.03361	-85.82583	65g
0314	0203	130	Geneva	HSCG-1	NPS Screening Station	Holmes Cr.	Holmes Creek Co. Rd. 4	1N/25E/25	31.02686	-85.49245	65g

Appendices F-1. Ecoregional Reference Site Program

Lead agency: ADEM

Purpose: Ecoregions are relatively homogeneous ecological areas defined by similarity of climate, landform, soil, potential natural vegetation, hydrology, or other ecologically relevant variables. Since 1991, ADEM has maintained a network of least-impaired ecoregional reference sites. Intensive monitoring assessments, including chemical, physical, habitat, and biological data, are collected to develop baseline reference conditions for each of Alabama's 29 Level IV sub-ecoregions (Griffith et al. 1997a). The reference condition establishes the basis for making comparisons and detecting use impairment.

Appendix F-1c. Chemical/physical data

Appendix F-2c. Metals data

References: ADEM. 2000a. Ecoregional reference site data collected by ADEM 1992 to 2000 (unpublished). Field Operations Division, Alabama Department of Environmental Management, Montgomery, AL.

Appendix F-1c. Physical/chemical data collected at Ecoregional Reference Sites located within the Choctawhatchee River CU.

Sub-Watershed	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	BOD-5	TSS	TDS	TOC	T-PO4	NO3+ NO2	NH3-N	TKN	Hardness	Alkalinity	TON
	#	*yymmdd*	*24hr*	*C*	*C*	*mg/l*	*s.u.*	*umhos @25c*	*NTU*	*cfs*	*col/100ml*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
Upper Choctawhatchee (0314-0201)																						
130	BRH-1	990715			24	7.6	6.4	48	8.51	**	93	0.7	3	114	7.73	0.07	0.16	<MDL	0.32	14	12	0.32
Pea River (0314-0202)																						
010	DRYB-1	990715			24	7.5	6.6	57	22.4	4.1	200	0.8	3	87	4.07	0.05	0.14	<MDL	<MDL	20.1	19	<MDL

* - No Flow ; ** - High Flow; ***Not Wadeable

Appendix F-2c. Results of metals, chloride and sulfate analyses from Ecoregional Reference Site stations located within the Choctawhatchee River basin.

Sub- Watershed Number	Station Number	Date (YYMMDD)	Time (24hr)	Al (mg/l)	Ca (mg/l)	Cu (mg/l)	Fe (mg/l)	Mg (mg/l)	Mn (mg/l)	Zn (mg/l)	As (mg/l)	Cl (mg/l)	SO4 (mg/l)
Upper Choctawhatchee (0314-0201)													
130	BRH-1	990715		<MDL	3.58	<MDL	2.07	1.24	0.18	<MDL	<MDL	6.81	1.64
Pea (0314-0202)													
10	DRYB-1	990715		<MDL	6.39	<MDL	2.18	1.01	0.13	<MDL	<MDL	5.67	4.46

Apppendix F-3 State Parks Monitoring Project

***Lead agency*:** ADEM

***Purpose*:** The objectives of this project were to assess water quality of flowing streams in sub-watersheds located within Alabama's state parks, to identify current and potential causes and sources of impairments, and to identify non or minimally-impaired streams that may be considered for water use classification upgrade to Outstanding Alabama Water (OAW) (ADEM 1999). Intensive monitoring assessments, including chemical, physical, habitat, and biological data, were conducted at 34 sites in or near 9 state parks during 1998.

Appendix F-3c. Physical/ chemical data

References: ADEM. 1999d. Monitoring of Watersheds associated with Alabama State Parks utilizing chemical, physical and biological assessments. Environmental Indicators Section. Field Operations Division. Alabama Department of Environmental Management. Montgomery, AL.

Appendix F-3c. Physical/ chemical data collected from May to September 1998 as part of the State Parks Monitoring Project conducted by ADEM. (ADEM 1999d)

Sub-Watershed	Station	Date	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	BOD-5	TSS	TDS	Alkalinity	Hardness	T-PO4	NO3+ NO2	NH3-N	TKN	Cl-
#	#	*yymmdd*	*C*	*mg/l*	*s.u.*	*umhos @25c*	*NTU*	*cfs*	*col/100ml*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
Upper Choctawhatchee River (0314-0201)																			
050	BSPB-1	980521	19.4	7.6	6.6	242	0.5	4.7	1	0.2	1.0	134	117	115.6	0.020	0.920	<0.015	<0.15	4.4
050	BSPB-1	980701	22.0	5.3	7.3	228	2.5	5.1	13	0.5	4.0	68	29	33.8	0.014	0.360	<0.015	<0.15	
050	BSPB-1	981006	19.1	4.7	7.2	237	0.6	8.6	<1	0.3	<1	82	112	120.0	0.030	0.950	<0.015	<0.15	4.9
050	WCHB-1	980521	23.5	6.5	7.3	68	14.0		70	1.8	8.0	57	25	28.4	0.010	0.350	<0.015	<0.15	4.8
050	WCHB-1	980701	28.0	6.4	7.0	89	11.0		80	1.6	1.0	156	114	115.0	0.030	1.010	<0.015	<0.15	
050	WCHB-1	981006	23.2	5.9	6.8	59	10.2		123	0.3	6.0	13	45	25.7	0.020	<0.15	<0.015	0.60	5.9
050	WCHB-2	980521	22.8	6.7	6.5	85	12.7	69.6	100	0.2	8.0	59	28	36.2	0.010	0.390	<0.015	<0.15	4.7
050	WCHB-2	980701	26.0	6.3	7.0	122	9.4	38.5	50		2.0	92							
050	WCHB-2	981006	22.9	6.0	6.5	72	9.0		77	0.3	8.0	33	32	32.1	0.010	0.190	<0.015	0.47	5.8

Appendix F-4c. Surface water quality data collected by Troy State Environmental Research & Services during 1994 to 1996 from selected stations in the Choctawhatchee River CU (Troy State University 1997)

CU	Sub-watershed #	Stream Name	Station #	Date *yymmdd*	Time *24hr*	T-H2O *C*	Dissolved Oxygen *mg/l*	pH *s.u.*	Conductivity *mmhos/cm*	Turbidity *NTU*	Fecal Coliform *MPN/100m*	Total Alkalinity *mg/l*	Total Hardness *mg/l*	TSS *mg/l*	TDS *mg/l*	Chloride *mg/l*	NH3-N *mg/l*	NO2+NO3 *mg/l*	NO2-N *mg/l*	T-PO4 *mg/l*	Ortho-P *mg/l*
Upper Choctawhatchee (0314-0201)																					
0202	010	Big Sandy Cr	TSCP-1	940920	900	20	6.2	6.2	0.047	10		14	18	6.4	95.6	15.0	0.019	0.4	<MDL	0.21	0.01
0202	010	Big Sandy Cr	TSCP-1	941218	710	11	8.6	6.6	0.061	12		18	26	5.4	50.6	11.0	0.385	0.4	<MDL	0.27	0.02
0202	010	Big Sandy Cr	TSCP-1	950417	1240	18	6.9	6.9	0.058	17		16	22	15.5	68.5		1.490	0.5	<MDL	0.18	0.04
0202	010	Big Sandy Cr	TSCP-1	950726	754	26	6.5	6.7	0.084	14		21	26	31.1	62.9	11.5	0.509	0.4	<MDL	0.26	0.04
0202	010	Big Sandy Cr	TSCP-1	951112	655	11	7.5	6.6	0.044	27		12	26	26.3	63.7	10.0	0.203	0.6	<MDL	0.31	0.03
0202	010	Big Sandy Cr	TSCP-1	960212	635	11	9.0	6.9	0.042	10		10	14	8.8	57.2	11.0	0.310	0.3	0.01	0.31	0.07
0202	010	Big Sandy Cr	TSCP-1	960516	620	20	6.2	7.2	0.067	18		20	23	13.6	68.4	12.5	1.140	0.7	<MDL	0.43	0.1
0202	010	Big Sandy Cr	TSCP-1	960728	620	24	4.9	6.8	0.066	17		16	24	10.2	75.8	8.0	0.484	0.4	<MDL	0.52	0.09
0201	140	Pea R	TSCP-10	940928	1225	24	8.5	7.1	0.075	17		30	38	16.2	69.8	29.5	0.021	0.6	0.01	0.22	0.02
0201	140	Pea R	TSCP-10	941206	737	15	8.5	7.0	0.053	22		16	22	18.0	78.0	10.0	0.136	0.5	<0.01	0.27	0.05
0201	140	Pea R	TSCP-10	950404	712	16	8.6	7.3	0.069	14		22	24	15.4	74.6		0.312	0.6	0.01	0.16	0.05
0201	140	Pea R	TSCP-10	950726	1445	31	6.7	7.4	0.104	13		32	35	17.2	74.8	11.5	0.196	0.5	<MDL	0.11	0.06
0201	140	Pea R	TSCP-10	951112	1440	15	8.6	6.5	0.046	95		13	17	108.1	65.9	8.5	0.270	0.6	<MDL	0.72	0.18
0201	140	Pea R	TSCP-10	960212	1455	12	9.6	7.0	0.055	18		15	17	22.0	52.0	11.0	0.199	0.5	<MDL	0.36	0.06
0201	140	Pea R	TSCP-10	960602	1130	24	7.2	7.0	0.063	38		20	22	42.2	69.8	7.5	0.581	0.7	<MDL	0.37	0.08
0201	140	Pea R	TSCP-10	960728	1455	28	7.2	7.2	0.084	23		24	29	25.0	77.0	9.0	0.528	0.6	<0.01	0.53	0.16
0201	020	E Fk Choctawhatchee R	TSCP-11	940920	1330	24	6.9	7.1	0.096	12		38	42	2.6	109.4	14.5	0.019	0.2	0.01	0.17	0.01
0201	020	E Fk Choctawhatchee R	TSCP-11	941218	942	12	8.9	6.7	0.083	8		36	40	3.6	66.4	9.0	0.062	0.3	0.01	0.16	0.01
0201	020	E Fk Choctawhatchee R	TSCP-11	950417	1025	19	8.1	7.2	0.087	12		32	36	6.2	75.8		1.020	0.4	<MDL	0.1	0.03
0201	020	E Fk Choctawhatchee R	TSCP-11	950726	955	27	6.7	7.5	0.167	6		68	69	6.1	113.9	10.5	0.188	0.3	<MDL	0.1	0.05
0201	020	E Fk Choctawhatchee R	TSCP-11	951112	915	11	9.0	6.9	0.049	12		14	19	5.4	48.6	6.5	0.278	0.2	<0.01	0.08	0.03
0201	020	E Fk Choctawhatchee R	TSCP-11	960212	850	12	9.1	7.0	0.054	9		18	20	4.6	59.4	8.5	0.303	0.2	<MDL	0.18	0.15
0201	020	E Fk Choctawhatchee R	TSCP-11	960516	850	21	7.1	7.4	0.118	16		43	46	5.6	80.4	12.5	0.466	0.6	<MDL	0.39	0.06
0201	020	E Fk Choctawhatchee R	TSCP-11	960728	828	25	6.3	7.5	0.160	8		64	70	4.0	218.0	8.0	0.304	0.3	0.02	0.42	0.08
0201	050	W Fk Choctawhatchee R	TSCP-12	940920	1200	24	6.8	7.1	0.067	8		26	28	2.2	83.8	13.5	0.019	0.4	<MDL	0.1	0.01
0201	050	W Fk Choctawhatchee R	TSCP-12	941108	1540	19	8.2	7.4	0.072	7		30	30								
0201	050	W Fk Choctawhatchee R	TSCP-12	941218	831	12	8.7	6.7	0.066	7		22	36	1.8	48.2	9.5	0.266	0.5	<0.01	0.16	0.01
0201	050	W Fk Choctawhatchee R	TSCP-12	950417	1125	19	8.1	7.0	0.072	9		24	28	4.6	59.4		1.350	0.5	<0.01	0.23	0.02
0201	050	W Fk Choctawhatchee R	TSCP-12	950726	910	25	6.3	7.2	0.113	8		38	42	5.7	81.3	10.5	0.202	0.3	<MDL	0.03	0.02
0201	050	W Fk Choctawhatchee R	TSCP-12	951112	820	10	8.7	6.8	0.043	20		11	18	6.4	37.6	9.0	0.339	0.3	<0.01	0.12	0.04
0201	050	W Fk Choctawhatchee R	TSCP-12	960212	805	10	9.1	7.1	0.049	6		14	18	3.4	52.6	9.5	0.528	0.3	<MDL	0.23	0.04
0201	050	W Fk Choctawhatchee R	TSCP-12	960516	745	21	6.6	7.2	0.085	9		28	30	5.8	64.2	14.0	0.635	0.6	<MDL	0.17	0.08

Appendix F-4c. Surface water quality data collected by Troy State Environmental Research & Services during 1994 to 1996 from selected stations in the Choctawhatchee River CU (Troy State University 1997)

CU	Sub-watershed	Stream Name	Station	Date	Time	T-H2O	Dissolved Oxygen	pH	Conductivity	Turbidity	Fecal Coliform	Total Alkalinity	Total Hardness	TSS	TDS	Chloride	NH3-N	NO2+ NO3	NO2-N	T-PO4	Ortho-P
0201	050	W Fk Choctawhatchee R	TSCP-12	960728	740	24	6.5	7.2	0.078	9		24	28	6.6	65.4	10.0	1.100	0.5	0.01	0.42	0.1
0201	070	W Fk Choctawhatchee R	TSCP-13	940920	1425	25	7.6	7.3	0.059	9		23	26	10.0	108.0	12.5	0.020	0.5	<MDL	0.16	0.01
0201	070	W Fk Choctawhatchee R	TSCP-13	941218	1027	12	10.2	6.8	0.069	8		26	30	3.2	61.8	9.5	0.206	0.5	0.01	0.08	0.01
0201	070	W Fk Choctawhatchee R	TSCP-13	950417	957	18	8.5	7.1	0.069	13		22	26	10.0	58.0		1.890	0.5	<MDL	0.09	0.02
0201	070	W Fk Choctawhatchee R	TSCP-13	950726	1026	27	7.1	7.4	0.100	18		35	38	16.4	73.6	11.0	0.142	0.5	<MDL	0.13	0.03
0201	070	W Fk Choctawhatchee R	TSCP-13	951112	947	13	9.4	7.1	0.053	16		14	18	10.4	47.6	9.5	0.212	0.3	<MDL	0.14	0.03
0201	070	W Fk Choctawhatchee R	TSCP-13	960212	930	12	9.7	7.0	0.052	7		16	19	5.0	55.0	11.0	0.211	0.4	<0.01	0.31	0.04
0201	070	W Fk Choctawhatchee R	TSCP-13	960516	920	21	7.9	7.4	0.085	9		28	30	2.4	73.6	13.5	0.305	0.6	<MDL	0.2	0.09
0201	070	W Fk Choctawhatchee R	TSCP-13	960728	902	25	7.4	7.4	0.080	10		28	30	12.8	69.2	8.5	0.024	0.6	0.01	0.42	0.12
0201	110	Choctawhatchee R	TSCP-14	940920	1525	25	7.6	7.1	0.063	13		22	24	9.6	94.4	17.0	0.021	0.5	<MDL	0.18	0.01
0201	110	Choctawhatchee R	TSCP-14	941218	1106	13	9.8	6.8	0.063	8		20	24	3.0	53.0	11.0	0.194	0.6	0.01	0.11	0.01
0201	110	Choctawhatchee R	TSCP-14	950417	720	18	8.6	7.1	0.062	13		19	23	11.0	59.0		2.030	0.6	<MDL	0.15	0.04
0201	110	Choctawhatchee R	TSCP-14	950726	1135	27	7.6	7.1	0.067	120		18	18	135.2	100.8	11.0	0.162	0.7	0.01	0.69	0.14
0201	110	Choctawhatchee R	TSCP-14	951112	1105	13	9.2	6.9	0.042	32		12	15	30.0	54.0	10.5	0.542	0.5	0.01	0.33	0.05
0201	110	Choctawhatchee R	TSCP-14	960212	1045	12	10.0	7.1	0.047	9		13	16	7.8	54.2	10.0	0.290	0.4	<MDL	0.2	0.05
0201	110	Choctawhatchee R	TSCP-14	960602	745	22	7.9	7.1	0.060	17		18	22	14.6	61.4	9.5	1.470	0.6	<MDL	0.24	0.1
0201	110	Choctawhatchee R	TSCP-14	960728	1045	27	7.8	7.6	0.098	6		34	39	7.4	80.6	8.5	0.073	0.5	0.02	0.42	0.06
0201	130	L Choctawhatchee R	TSCP-15	940928	640	20	6.6	6.8	0.092	10		30	35	8.4	67.6	30.0	0.017	0.9	<MDL	0.17	0.01
0201	130	L Choctawhatchee R	TSCP-15	941218	1124	15	8.5	6.5	0.091	4		28	34	1.4	64.6	9.5	0.160	1.0	0.01	0.13	0.01
0201	130	L Choctawhatchee R	TSCP-15	950417	917	19	7.4	7.0	0.095	6		28	32	2.5	73.5		0.783	1.1	<MDL	0.09	0.03
0201	130	L Choctawhatchee R	TSCP-15	950726	1237	25	6.4	6.7	0.100	21		26	31	19.8	86.2	11.0	0.479	1.0	<MDL	0.18	0.04
0201	130	L Choctawhatchee R	TSCP-15	951112	1205	12	8.9	7.1	0.093	16		26	29	3.2	64.8	9.0	0.208	0.6	<MDL	0.32	0.03
0201	130	L Choctawhatchee R	TSCP-15	960212	1210	12	9.9	7.1	0.099	4		28	34	2.2	83.8	12.5	4.300	0.9	<MDL	0.19	0.07
0201	130	L Choctawhatchee R	TSCP-15	960602	850	22	7.0	7.1	0.090	7		32	37	2.5	75.5	10.8	0.869	0.7	<MDL	0.22	0.06
0201	130	L Choctawhatchee R	TSCP-15	960728	1205	25	6.6	7.1	0.104	6		34	39	1.6	86.4	9.5	0.216	0.9	0.03	0.42	0.11
0201	130	L Choctawhatchee R	TSCP-16	940928	750	20	7.4	7.2	0.094	10		25	26	10.0	74.0	36.5	0.019	1.1	0.02	0.39	0.06
0201	130	L Choctawhatchee R	TSCP-16	941218	1143	14	9.3	6.8	0.090	7		20	22	3.2	68.8	14.0	0.182	1.2	0.01	0.28	0.09
0201	130	L Choctawhatchee R	TSCP-16	950417	750	19	8.2	7.0	0.090	9		20	23	7.4	88.6		3.230	1.3	<0.01	0.41	0.11
0201	130	L Choctawhatchee R	TSCP-16	950726	1207	25	7.0	6.8	0.070	75		16	18	97.4	80.6	12.5	0.239	1.3	0.01	0.94	0.22
0201	130	L Choctawhatchee R	TSCP-16	951112	1135	12	9.3	7.0	0.083	14		20	23	6.8	61.2	10.0	0.222	0.8	0.02	0.32	0.12
0201	130	L Choctawhatchee R	TSCP-16	960212	1130	12	9.8	7.0	0.089	8		20	21	5.2	86.8	15.0	0.743	1.2	<MDL	0.44	0.13
0201	130	L Choctawhatchee R	TSCP-16	960602	815	22	7.6	6.9	0.110	8		28	28	5.4	88.6	13.8	1.020	1.2	<MDL	0.51	0.32
0201	130	L Choctawhatchee R	TSCP-16	960728	1130	26	7.5	7.5	0.133	6		32	32	5.0	111.0	14.0	1.110	1.4	0.02	0.83	0.44
0201	130	Hurricane Cr	TSCP-17	940928	1020	23	7.0	7.0	0.057	13		17	20	11.0	55.0	21.5	0.020	0.9	<MDL	0.18	0.06

Appendix F-4c. Surface water quality data collected by Troy State Environmental Research & Services during 1994 to 1996 from selected stations in the Choctawhatchee River CU (Troy State University 1997)

CU	Sub-watershed	Stream Name	Station	Date	Time	T-H2O	Dissolved Oxygen	pH	Conductivity	Turbidity	Fecal Coliform	Total Alkalinity	Total Hardness	TSS	TDS	Chloride	NH3-N	NO2+ NO3	NO2-N	T-PO4	Ortho-P
0201	130	Hurricane Cr	TSCP-17	941218	1327	15	8.4	6.7	0.058	7		16	22	3.4	42.6	10.0	0.329	0.9	<0.01	0.19	0.01
0201	130	Hurricane Cr	TSCP-17	950417	843	19	8.3	6.8	0.057	9		14	18	11.6	54.4		1.470	0.8	<MDL	0.3	0.07
0201	130	Hurricane Cr	TSCP-17	950726	1343	24	6.8	6.4	0.060	70		10	14	88.0	64.0	11.0	0.844	1.4	0.01	0.82	0.34
0201	130	Hurricane Cr	TSCP-17	951112	1320	14	9.0	6.9	0.065	22		15	22	10.2	59.8	9.5	0.560	0.9	<MDL	0.28	0.12
0201	130	Hurricane Cr	TSCP-17	960212	1340	14	9.4	7.1	0.063	6		16	18	4.0	64.0	11.0	0.506	0.7	<MDL	0.43	0.07
0201	130	Hurricane Cr	TSCP-17	960602	1015	22	7.9	6.9	0.060	7		20	22	7.8	51.2	8.5	0.088	0.9	<MDL	0.28	0.1
0201	130	Hurricane Cr	TSCP-17	960728	1330	24	7.7	6.9	0.074	6		23	24	2.8	73.2	8.5	0.205	1.0	0.01	0.5	0.1
0201	140	L Claybank Cr	TSCP-18	940920	1625	25	5.8	7.0	0.090	7		28	26	6.0	86.0	22.0	0.090	0.7	0.02	0.23	0.03
0201	140	L Claybank Cr	TSCP-18	941218	1500	14	8.3	7.1	0.087	20		26	24	14.0	80.0	9.5	1.250	0.7	0.01	0.26	0.01
0201	140	L Claybank Cr	TSCP-18	950417	645	16	9.1	7.1	0.086	12		22	22	15.4	70.6		6.610	0.5	0.01	0.18	0.05
0201	140	L Claybank Cr	TSCP-18	950726	1058	25	7.0	7.1	0.088	35		14	15	26.2	81.8	12.0	0.293	0.7	<MDL	0.14	0.04
0201	140	L Claybank Cr	TSCP-18	951112	1025	12	9.6	6.8	0.075	25		18	22	24.5	69.5	10.5	0.450	0.8	<MDL	0.34	0.08
0201	140	L Claybank Cr	TSCP-18	960212	1010	8	10.8	7.0	0.074	9		15	20	9.6	60.4	12.0	0.396	0.7	<MDL	0.26	0.07
0201	140	L Claybank Cr	TSCP-18	960516	955					14		25	25	10.4	85.6	18.0	1.020	0.7	0.02	0.27	0.1
0201	140	L Claybank Cr	TSCP-18	960602	700	19	7.1	6.9	0.120	9		35	30	6.7	109.3	13.0		0.8		0.3	0.11
0201	140	L Claybank Cr	TSCP-18	960728	938	24	4.6	7.0	0.157	16		47	30	7.6	170.4	13.5	1.260	1.1	0.03	0.6	0.09
0201	160	Claybank Cr	TSCP-19	940928	900	22	7.6	7.5	0.058	26		16	18	31.8	66.2	27.5	0.210	1.0	0.04	0.28	0.01
0201	160	Claybank Cr	TSCP-19	941218	1417	15	9.1	7.2	0.059	14		14	18	12.0	44.0	9.5	0.187	1.0	<0.01	0.22	0.02
0201	160	Claybank Cr	TSCP-19	950413	1107	18	8.9	7.0	0.045	41		10	10	58.5	62.0		3.560	0.7	0.01	0.34	0
0201	160	Claybank Cr	TSCP-19	950726	1312	26	6.4	6.8	0.069	70		15	18	36.7	235.3	12.5	0.223	1.3	0.02	1.24	0.28
0201	160	Claybank Cr	TSCP-19	951112	1245	13	9.4	6.6	0.043	50		10	12	57.3	28.7	8.5	0.233	0.6	<MDL	0.54	0.11
0201	160	Claybank Cr	TSCP-19	960212	1255	11	10.3	6.8	0.049	16		12	14	16.6	55.4	11.5	0.707	0.6	<MDL	0.42	0.1
0201	160	Claybank Cr	TSCP-19	960602	930	23	7.6	7.2	0.061	15		17	19	12.0	60.0	10.3	0.518	1.0	<MDL	0.26	0.12
0201	160	Claybank Cr	TSCP-19	960728	1245	26	7.8	7.2	0.075	13		18	20	6.8	75.2	9.5	0.724	1.0	<MDL	0.53	0.18
0202	010	Pea R	TSCP-2	940920	745	20	6.1	6.6	0.067	17		22	26	5.6	106.4	14.0	0.018	0.3	<MDL	0.24	0.06
0202	010	Pea R	TSCP-2	941218	620	11	8.4	6.6	0.067	15		18	24	5.8	66.2	15.0	0.224	0.4	<MDL	0.22	0.02
0202	010	Pea R	TSCP-2	950417	1313	18	7.3	6.9	0.074	22		20	26	10.2	83.8		1.530	0.5	<MDL	0.33	0.05
0202	010	Pea R	TSCP-2	950726	720	26	6.8	6.8	0.081	17		16	24	6.4	95.6	11.0	0.919	0.5	<MDL	0.18	0.06
0202	010	Pea R	TSCP-2	951112	615	12	7.7	6.7	0.061	16		12	22	6.6	65.4	15.0	0.168	0.3	<MDL	0.37	0.05
0202	010	Pea R	TSCP-2	960212	604	12	8.9	6.7	0.050	16		10	18	9.2	64.8	10.0	0.263	0.3	<0.01	0.17	0.06
0202	010	Pea R	TSCP-2	960516	540	20	6.3	7.4	0.087	26		23	25	9.8	96.2	17.5	0.913	0.7	<MDL	0.37	0.05
0202	010	Pea R	TSCP-2	960728	535	24	6.3	6.6	0.071	23		10	18	10.0	84.0	10.5	0.678	0.3	<MDL	0.7	0.11
0201	220	Choctawhatchee R	TSCP-20	940928	1130	25	8.4	7.0	0.067	20		21	24	3.6	88.4	26.0	0.020	0.9	0.01	0.22	0.02
0201	220	Choctawhatchee R	TSCP-20	941206	645	16	8.2	6.7	0.055	27		15	19	19.6	86.4	12.5	0.173	0.7	<0.01	0.24	0.02

Appendix F-4c. Surface water quality data collected by Troy State Environmental Research & Services during 1994 to 1996 from selected stations in the Choctawhatchee River CU (Troy State University 1997)

CU	Sub-watershed	Stream Name	Station	Date	Time	T-H2O	Dissolved Oxygen	pH	Conductivity	Turbidity	Fecal Coliform	Total Alkalinity	Total Hardness	TSS	TDS	Chloride	NH3-N	NO2+ NO3	NO2-N	T-PO4	Ortho-P
0201	220	Choctawhatchee R	TSCP-20	950404	640	16	8.5	7.4	0.064	16		18	22	16.0	64.0		0.340	0.8	<MDL	0.19	0.06
0201	220	Choctawhatchee R	TSCP-20	950726	1425	29	7.0	7.3	0.090	11		24	27	26.8	69.2	11.5	0.150	1.0	<MDL	0.33	0.07
0201	220	Choctawhatchee R	TSCP-20	951112	1415	14	8.2	6.9	0.043	85		13	13	101.1	58.9	8.9	0.171	0.6	<MDL	0.67	0.16
0201	220	Choctawhatchee R	TSCP-20	960212	1425	13	9.9	7.1	0.054	17		14	16	17.6	53.4	11.0	0.384	0.6	<MDL	0.32	0.09
0201	220	Choctawhatchee R	TSCP-20	960602	1100	25	7.0	6.8	0.060	22		18	22	26.4	63.6	9.0	0.541	0.9	<MDL	0.33	0.12
0201	220	Choctawhatchee R	TSCP-20	960728	1415	28	7.0	7.3	0.091	9		27	30	15.2	82.8	10.0	1.410	0.9	0.03	0.44	0.15
0202	050	Blue Spring	TSCP-21	940920	1130	24		7.4	0.229			105	120						0.03		
0202	050	Blue Spring	TSCP-21	941108	1520	21		7.2	0.228			105	150								
0202	040	Bowden Mill Creek	TSCP-22	941107	920	17	8.9	6.8	0.104	7		45	60								
0202	030	Buckhorn Creek	TSCP-24	940920	655	19	6.6	6.7	0.041												
0202	030	Buckhorn Creek	TSCP-24	941105	815	25	6.6	6.5	0.049	15		15	20								
0201	140	Claybank Creek	TSCP-25	940920	1700	23	7.3	7.0	0.042	17		12	12	6.2	79.8	15.5	0.026	0.5	ND	0.22	ND
0201	140	Claybank Creek	TSCP-25	941218	1536	14	9.1	7.1	0.042	12		8	12	4.8	41.2	9.0	0.547	0.7	<0.01	0.2	0.01
0201	140	Claybank Creek	TSCP-25	950417	620	18	8.0	6.8	0.036	10		8	11	7.4	48.6		2.120	0.5	ND	0.18	0.04
0202	040	Clearwater Creek	TSCP-26	941107	850	16	7.8	6.5	0.045	9		15	20								
0202	010	Conner's Creek	TSCP-27	940920	715	19	8.0	6.6	0.031			15	20								
0202	010	Connor's Creek	TSCP-27	941105	845	18	9.2	6.5	0.027	5		10	10								
?	?	Corner Creek	TSCP-28	940927	1345	25	4.5	5.5				30	40								
?	?	Corner Creek	TSCP-28	941027	1130	15	2.4	5.5		15		15	10								
?	?	Corner Creek	TSCP-28	950111	1025	10	11.0	5.5		2		15	20								
?	?	Corner Creek	TSCP-28	950224	1030	15	8.6	6.0		20		35	80								
0202	040	Halls Creek	TSCP-29	941107	1040	17	9.9	7.0	0.058	13		20	30								
0202	020	Stinking Cr	TSCP-3	940920	955	20	7.6	6.1	0.026	10		8	8	9.8	62.2	12.5	0.023	0.2	0.01	0.15	0.01
0202	020	Stinking Cr	TSCP-3	941218	740	11	8.9	6.7	0.028	8		12	20	5.6	26.4	8.0	0.450	0.2	<MDL	0.14	0.02
0202	020	Stinking Cr	TSCP-3	950417	1218	17	8.2	6.4	0.025	13		5	8	8.0	40.0		1.460	0.2	<MDL	0.07	0.03
0202	020	Stinking Cr	TSCP-3	950726	819	25	5.1	6.4	0.031	15		7	9	16.4	37.6	9.0	0.511	0.8	<MDL	0.14	0.03
0202	020	Stinking Cr	TSCP-3	951112	725	10	8.9	6.3	0.027	10		6	10	10.6	23.4	9.5	0.223	0.2	<0.01	0.26	0.03
0202	020	Stinking Cr	TSCP-3	960212	712	9	10.0	6.3	0.023	12		3	9	6.8	35.2	9.0	0.364	0.1	<MDL	0.25	0.05
0202	020	Stinking Cr	TSCP-3	960516	645	19	6.3	6.7	0.032	16		7	8	19.0	37.0	12.5	0.832	0.3	<MDL	0.26	0.07
0202	020	Stinking Cr	TSCP-3	960728	655	23	7.4	6.6	0.027	14		6	8	14.2	35.8	6.5	1.340	<MDL	<MDL	0.4	0.04
0202	070	Mims Creek	TSCP-30	941107	820	16	8.1	6.8	0.102	18		40	50								
0202	090	Pea Creek	TSCP-31	941107	1550	17	9.7	6.6	0.030	8		10	10								
?	?	Pea River	TSCP-32	940817	1730	23	6.2	7.0		10		40	50								
?	?	Pea River	TSCP-32	940915	1245	23	5.2	7.0		10		55	70								

Appendix F-4c. Surface water quality data collected by Troy State Environmental Research & Services during 1994 to 1996 from selected stations in the Choctawhatchee River CU (Troy State University 1997)

CU	Sub-watershed	Stream Name	Station	Date	Time	T-H2O	Dissolved Oxygen	pH	Conductivity	Turbidity	Fecal Coliform	Total Alkalinity	Total Hardness	TSS	TDS	Chloride	NH3-N	NO2+ NO3	NO2-N	T-PO4	Ortho-P
?	?	Pea River	TSCP-32	941014	1400	20	7.6	7.0		10		60	50								
?	?	Pea River	TSCP-32	941220	1330	10	4.8	7.0		10		30	50								
?	?	Pea River	TSCP-32	950224	1130	12	8.8	7.0		25		30	60								
?	?	Pea River	TSCP-32	950324	1400	18	8.0	7.0		10		30	60								
?	?	Pea River	TSCP-32	950417	1335	17	8.8	7.0		10		40	50								
?	?	Pea River	TSCP-32	951118	1315	15	8.8	7.0		10		40	60								
?	?	Pea River	TSCP-33	950413	635	18	8.3	7.3	0.057	38		16	20	62.0	62.0		3.100	0.7	ND	0.35	0.04
0202	040	Pea River	TSCP-34	941107	1115	18	9.8	6.9	0.065	8		20	40								
0202	040	Pea River	TSCP-36	941107	1005	17	9.9	7.0	0.065	8		25	30								
?	?	Pea River	TSCP-37	940817	1800	22	4.0	6.5		10		40	60								
?	?	Pea River	TSCP-37	940915	1145	24	3.4	6.5		10		35	40								
?	?	Pea River	TSCP-37	941014	1445	20	6.0	6.5		10		40	35								
?	?	Pea River	TSCP-37	941118	1400	15	5.0	6.5		5		60	50								
?	?	Pea River	TSCP-37	941220	1430	8	8.6	6.5		10		30	60								
?	?	Pea River	TSCP-37	950224	1230	13	9.4	6.5		20		20	50								
?	?	Pea River	TSCP-37	950324	1430	18	7.8	7.0		10		30	55								
?	?	Pea River	TSCP-37	950417	1420	17	7.0	6.5		15		35	50								
0201	220	Providence Creek	TSCP-38	941107	1345	20	9.0	6.9	0.100	7		40	60								
0202	030	Richland Creek	TSCP-39	941108	1430	18	7.8	6.8	0.063	9		50	40								
0202	040	Pea R	TSCP-4	940920	1755	23	7.6	6.9	0.054	15		19	22	5.6	96.4	20.0	0.022	0.4	<MDL	0.2	0.01
0202	040	Pea R	TSCP-4	941218	1606	13	9.6	6.7	0.061	12		18	22	5.4	56.6	9.5	0.596	0.4	<MDL	0.15	0.01
0202	040	Pea R	TSCP-4	950417	530	18	8.1	6.8	0.063	16		18	22	9.4	72.6		4.750	0.5	<MDL	0.12	0.03
0202	040	Pea R	TSCP-4	950726	1810	29	7.2	7.1	0.075	18		17	24	10.4	75.6	10.0	0.163	0.6	<MDL	0.32	0.06
0202	040	Pea R	TSCP-4	951113	820	11	9.4	6.5	0.045	24		11	13	12.0	56.0	9.5	0.278	0.4	<MDL	0.23	0.01
0202	040	Pea R	TSCP-4	960213	645	10	10.2	6.5	0.046	12		10	14	6.0	40.0	10.5	0.190	0.3	<MDL	0.39	0.07
0202	040	Pea R	TSCP-4	960602	615	22	7.2	6.5	0.062	22		12	18	17.0	65.0	7.5	0.159	0.4	<MDL	0.36	0.1
0202	040	Pea R	TSCP-4	960728	1820	26	7.4	7.1	0.065	19		17	21	11.0	65.0	9.0	0.442	0.5	<0.01	0.43	0.1
0202	030	Richland Creek	TSCP-40	941108	1320	18	6.5	6.6	0.062	13		25	40								
0202	030	Sandy Run Creek	TSCP-41	941108	1345	20	7.6	7.1	0.160	12		75	110								
0202	030	Sandy Run Creek	TSCP-42	940920	600	20	5.2	6.7	0.125			50	70								
0202	030	Sandy Run Creek	TSCP-42	941108	1410	19	7.0	7.0	0.126	11		60	80								
0202	060	Walnut Creek	TSCP-43	941105	740	25	8.4	6.5	0.077	10		30	30								
0202	060	Walnut Creek	TSCP-44	941004	1730	22	6.8	6.6	0.083			50	40								
0202	050	Whitewater Creek	TSCP-45	941107	755	15	8.1	6.5	0.078	8		35	40								

Appendix F-4c. Surface water quality data collected by Troy State Environmental Research & Services during 1994 to 1996 from selected stations in the Choctawhatchee River CU (Troy State University 1997)

CU	Sub-watershed	Stream Name	Station	Date	Time	T-H2O	Dissolved Oxygen	pH	Conductivity	Turbidity	Fecal Coliform	Total Alkalinity	Total Hardness	TSS	TDS	Chloride	NH3-N	NO2+ NO3	NO2-N	T-PO4	Ortho-P
0202	050	Whitewater Creek	TSCP-46	941108	1250	20	7.4	6.8	0.089	12		40	50								
0201	210	Wilkerson Creek	TSCP-47	941107	1230	19	9.5	6.8	0.056	9		20	30								
0201	210	Wilson Creek	TSCP-48	941107	1300	20	8.8	6.7	0.055	9		20	30								
0202	100	Beaverdam Creek	TSCP-49	941107	1525	18	9.2	6.8	0.039	12		15	20								
0202	040	Pea R	TSCP-5	940928	1410	25	7.6	7.3	0.056	13		18	20	5.6	68.4	21.0	0.022	0.5	<MDL	0.35	0.01
0202	040	Pea R	TSCP-5	941215	1615	10	10.2	7.1	0.056	15		16	22	8.2	71.8	10.5	0.165	0.4	<MDL	0.18	0.03
0202	040	Pea R	TSCP-5	950413	1205	18	8.3	7.1	0.051	22		12	19	26.8	51.2		1.270	0.6	0.02	0.16	0.02
0202	040	Pea R	TSCP-5	950726	1745	31	6.8	7.3	0.071	14		18	22	8.5	69.5	11.0	0.139	0.5	<MDL	0.16	0.04
0202	040	Pea R	TSCP-5	951113	735	11	9.7	6.6	0.046	8		12	14	15.0	53.0	9.5	0.362	0.4	<MDL	0.2	0.05
0202	040	Pea R	TSCP-5	960213	745	10	10.1	6.6	0.046	13		10	14	6.2	37.8	10.5	0.299	0.3	<MDL	0.46	0.07
0202	040	Pea R	TSCP-5	960602	1515	24	7.6	6.7	0.057	22		12	19	15.0	69.0	8.0	0.130	0.3	<MDL	0.35	0.1
0202	040	Pea R	TSCP-5	960728	1735	27	7.5	7.3	0.069	18		16	23	10.8	73.3	8.5	0.508	0.6	<MDL	0.68	0.14
0202	060	Walnut Cr	TSCP-6	940926	1030	20	7.2	7.0	0.169	17		45	45	8.8	135.2	30.0	0.018	1.6	0.01	0.25	0.1
0202	060	Walnut Cr	TSCP-6	941107	725	15	7.8	6.5	0.178	9		50	50								
0202	060	Walnut Cr	TSCP-6	941218	1650	12	8.5	6.7	0.143	13		38	42	4.0	130.0	16.0	0.164	1.3	<MDL	0.3	0.05
0202	060	Walnut Cr	TSCP-6	950413	1347	18	8.0	7.2	0.115	18		31	32	10.2	93.8		1.130	1.2	<0.01	0.29	0.07
0202	060	Walnut Cr	TSCP-6	950726	1850	26	6.0	6.8	0.123	45		21	29	24.0	110.0	13.0	0.120	1.4	<MDL	0.39	0.16
0202	060	Walnut Cr	TSCP-6	951113	645	8	10.0	7.0	0.126	26		26	22	3.4	78.6		0.367	0.7	<MDL	0.42	0.07
0202	060	Walnut Cr	TSCP-6	960213	840	6	11.1	7.0	0.116	6		32	32	2.4	45.6	13.0	0.200	0.5	<MDL	0.29	0.06
0202	060	Walnut Cr	TSCP-6	960602	1615	23	7.1	7.1	0.167	18		47	43	10.2	131.8	14.0	0.136	0.8	<MDL	0.53	0.19
0202	060	Walnut Cr	TSCP-6	960728	1855	25	6.5	7.4	0.223	15		55	67	7.2	174.8	17.5	0.381	1.6	<MDL	0.77	0.36
0202	080	Big Cr	TSCP-7	940926	810	18	7.8	7.4	0.113	10		42	48	8.2	89.8	23.0	0.016	0.4	0.01	0.2	0.05
0202	080	Big Cr	TSCP-7	941215	1510	11	10.4	6.9	0.114	7		46	56	2.8	109.2	10.0	0.185	0.4	<0.01	0.17	0.01
0202	080	Big Cr	TSCP-7	950413	1300	18	8.3	7.2	0.072	22		20	26	20.2	65.8		2.480	0.5	0.01	0.16	0.03
0202	080	Big Cr	TSCP-7	950726	1635	27	8.0	7.9	0.235	5		92	98	4.5	137.5	10.0	0.461	0.6	0.01	0.13	0.06
0202	080	Big Cr	TSCP-7	951112	1625	12	9.0	7.1	0.055	30		16	22	19.4	56.6	10.0	0.404	0.4	<MDL	0.37	0.05
0202	080	Big Cr	TSCP-7	960212	1635	12	10.2	7.0	0.081	8		24	30	4.2	53.8	10.5	0.145	0.3	<MDL	0.21	0.06
0202	080	Big Cr	TSCP-7	960602	1410	23	8.4	7.3	0.123	10		52	58	5.7	94.3	9.0	0.081	0.5	<MDL	0.34	0.05
0202	080	Big Cr	TSCP-7	960728	1630	25	7.5	7.5	0.129	14		42	49	10.4	99.6	9.5	0.363	0.3	<MDL	0.42	0.11
0202	070	Whitewater Cr	TSCP-8	940831	1035	24	7.8	7.0		10		35	40								
0202	070	Whitewater Cr	TSCP-8	940926	720	18	7.8	6.8	0.096	17		32	32	7.0	83.0	28.5	0.014	0.4	<MDL	0.2	0.01
0202	070	Whitewater Cr	TSCP-8	941215	1537	10	10.7	7.0	0.097	11		36	40	2.0	90.0	11.0	0.197	0.6	<MDL	0.14	0.02
0202	070	Whitewater Cr	TSCP-8	950112	1030	10	11.4	6.8		30		25	50								
0202	070	Whitewater Cr	TSCP-8	950413	1240	18	8.0	7.2	0.073	34		22	24	35.0	73.0		0.922	0.7	0.02	0.24	0.01

Appendix F-4c. Surface water quality data collected by Troy State Environmental Research & Services during 1994 to 1996 from selected stations in the Choctawhatchee River CU (Troy State University 1997)

CU	Sub-watershed	Stream Name	Station	Date	Time	T-H2O	Dissolved Oxygen	pH	Conductivity	Turbidity	Fecal Coliform	Total Alkalinity	Total Hardness	TSS	TDS	Chloride	NH3-N	NO2+ NO3	NO2-N	T-PO4	Ortho-P
0202	070	Whitewater Cr	TSCP-8	950726	1704	29	8.2	7.9	0.189	6		38	34	4.0	124.0	14.5	0.514	0.6	<MDL	0.12	0.05
0202	070	Whitewater Cr	TSCP-8	951026		16	9.4	7.0		10		45	60								
0202	070	Whitewater Cr	TSCP-8	951112	1645	13	9.1	7.0	0.053	27		15	21	18.6	55.4	9.5	0.145	0.4	<MDL	0.18	0.05
0202	070	Whitewater Cr	TSCP-8	960212	1705	12	9.8	6.9	0.071	12		20	23	5.6	51.4	11.5	0.190	0.4	<MDL	0.27	0.07
0202	070	Whitewater Cr	TSCP-8	960602	1445	24	8.2	7.5	0.102	18		37	38	6.3	83.7	9.0	0.099	0.7	<MDL	0.34	0.07
0202	070	Whitewater Cr	TSCP-8	960728	1655	25	7.7	7.3	0.094	29		24	27	21.3	92.8	10.5	0.970	0.5	<MDL	0.51	0.09
0202	070	Whitewater Cr	TSCP-8	940931	1325	21	8.0	7.7		15		45	50								
0202	090	Pea R	TSCP-9	940926	925	20	7.4	6.9	0.064	17		20	21	19.0	69.0	23.5	0.106	0.6	0.01	0.28	0.1
0202	090	Pea R	TSCP-9	941215	1425	11	10.5	6.7	0.056	16		14	22	9.0	67.0	11.0	0.286	0.5	<MDL	0.22	0.07
0202	090	Pea R	TSCP-9	950726	1610	30	7.8	7.7	0.108	12		32	35	13.4	82.6	12.0	0.142	0.5	<MDL	0.08	0.05
0202	090	Pea R	TSCP-9	951112	1600	13	8.1	6.8	0.050	40		15	17	52.8	51.2	10.0	0.166	0.5	<MDL	0.42	0.07
0202	090	Pea R	TSCP-9	960212	1605	12	9.7	7.0	0.044	15		10	14	11.4	40.6	10.5	0.323	0.4	<MDL	0.39	0.05
0202	090	Pea R	TSCP-9	960602	1330	24	6.8	7.0	0.053	23		14	19	28.4	57.6	8.0	0.113	0.3	<MDL	0.28	0.07
0202	090	Pea R	TSCP-9	960728	1600	28	8.4	7.4	0.075	23		21	25	19.3	80.7	9.0	0.481	0.5	<MDL	0.52	0.12
0201	230	Double Bridges Cr	TSDB-1	940515	7:30	22	6.1	6.5	0.047	33	140	12	15	21.5		17.5	0.465	2.4	<0.01	0.33	0.01
0201	230	Double Bridges Cr	TSDB-1	940827	17:50	27	6.1	6.8	0.049	23	<2000	14	18	7.8		14.5	0.067	0.9	<MDL	0.28	0.01
0201	230	Double Bridges Cr	TSDB-1	941215	12:17	10	9.5	7.0	0.046	17	<20	10	14	4.2		11.5	0.861	1.0	<0.01	0.10	0.01
0201	230	Double Bridges Cr	TSDB-1	950413	9:30	17	10.7	6.9	0.042	34	80	10	12	16.0		11.25	1.81	0.8	0.02	0.15	0.02
0201	230	Double Bridges Cr	TSDB-2	940515	10:30	24	6.6	6.5	0.060	29	<20	16	16	12.4		22	0.251	1.2	0.02	0.32	0.03
0201	230	Double Bridges Cr	TSDB-2	940827	14:37	29	6.6	6.7	0.061	21	<2000	18	20	11.6		15	0.055	1.1	0.04	0.24	0.02
0201	230	Double Bridges Cr	TSDB-2	941215	9:40	10	9.4	6.4	0.062	16	<20	16	18	3.8		12	1.53	1.1	0.01	0.24	0
0201	230	Double Bridges Cr	TSDB-2	950413	9:30	18	7.6	6.7	0.050	31	170	10	13	13.7		12.5	3.11	0.9	<0.01	0.22	0.03
0201	230	Double Bridges Cr	TSDB-3	940515	12:55	25	7.0	7.0	0.079	20	80	20	21	12.9		22	0.243	1.2	0.01	0.91	0.67
0201	230	Double Bridges Cr	TSDB-3	940827	12:00	26	6.9	6.7	0.079	20	<2000	20	22	17.0		17.5	0.053	2.5	0.03	0.74	0.47
0201	230	Double Bridges Cr	TSDB-3	941215	7:42	9	9.4	6.6	0.076	16	<20	16	22	8.5		13.5	2.99	2.6	>0.2	0.63	0.27
0201	230	Double Bridges Cr	TSDB-3	950404	14:40	16	8.2	7.0	0.077	21	40	14	19	13.5		14.5	0.799	2.6	0.16	0.64	0.31
0201	230	Double Bridges Cr	TSDB-3	960602	12:45	24	6.8	6.5	0.065	10		15	20						0.01		
0201	230	Double Bridges Cr	TSDB-4	940515	14:10	26	7.5	6.5	0.074	16	<20	16	20	6.8		18	0.211	1.2	0.04	0.64	0.28
0201	230	Double Bridges Cr	TSDB-4	941206	15:30	17	7.6	6.7	0.059	28	<20	16	20	21.0		12	0.481	1.8	0.08	0.53	0.02
0201	230	Double Bridges Cr	TSDB-4	950404	12:50	16	8.8	6.9	0.073	18	40	12	18	9.0		13	0.454	2.4	0.10	0.56	0.26
0201	230	Blanket Cr	TSDB-8	940515	8:40	24	5.1	7.0	0.118	26	<20	32	32	24.6		25	0.428	1.4	0.02	1.23	0.91
0201	230	Blanket Cr	TSDB-8	940827	16:10	29	5.9	6.7	0.125	17	8000	30	36	10.2		19.5	0.423	2.4	0.05	0.84	0.63
0201	230	Blanket Cr	TSDB-8	941215	11:45	11	9.0	6.9	0.093	18	<20	22	28	5.7		15	1.43	1.6	0.01	0.78	0.56
0201	230	Blanket Cr	TSDB-8	950413	10:00	18	7.3	6.9	0.084	22	230	16	20	12.4		14.5	0.74	0.9	0.02	0.58	0.28

Appendix F-4c. Surface water quality data collected by Troy State Environmental Research & Services during 1994 to 1996 from selected stations in the Choctawhatchee River CU (Troy State University 1997)

CU	Sub-watershed	Stream Name	Station	Date	Time	T-H2O	Dissolved Oxygen	pH	Conductivity	Turbidity	Fecal Coliform	Total Alkalinity	Total Hardness	TSS	TDS	Chloride	NH3-N	NO2+NO3	NO2-N	T-PO4	Ortho-P
0201	230	Blanket Cr	TSDB-8	950912	15:20	27	6.0	6.5				25	30								
0201	230	Little Double Bridges Cr	TSDB-9	940515	6:30	20	7.8	6.5	0.033	12	140	10	9	9.0		17.5	0.377	3.7	0.01	0.16	0.01
0201	230	Little Double Bridges Cr	TSDB-9	940827	19:00	25	6.1	6.7	0.038	15	<2000	16	18	9.0		14	0.067	0.6	<MDL	0.13	0.01
0201	230	Little Double Bridges Cr	TSDB-9	941215	13:05	12	9.8	6.8	0.038	7	<20	8	16	2.6		10.5	0.587	0.6	<0.01	0.11	0.04
0201	230	Little Double Bridges Cr	TSDB-9	950404	15:45	17	8.7	6.6	0.034	48	230	7	15	47.0		11.5	0.874	0.8	0.03	0.20	0.07
0201	230	Little Double Bridges Cr	TSDB-10	940515	8:10	25	6.1	6.5	0.036	21	70	8	10	25.1		17.5	0.442	1.1	0.02	0.23	0.01
0201	230	Little Double Bridges Cr	TSDB-10	940827	18:25	25	7.2	6.7	0.038	16		10	14	5.7		16.5	0.069	0.7	<MDL	0.16	0.01
0201	230	Little Double Bridges Cr	TSDB-10	941215	13:37	11	9.2	7.0	0.036	11	<20	8	12	2.2		11	0.742	0.6	<0.01	0.10	0.01
0201	230	Little Double Bridges Cr	TSDB-10	950413	7:17	17	7.6	6.6	0.034	22	230	6	11	16.8		10	1.74	0.6	<0.01	0.12	0.02
0201	230	Little Double Bridges Cr	TSDB-11	940515	9:45	23	6.5	6.7	0.039	27	270	10	13	20.0		14	0.373	1.8	0.03	0.20	0.01
0201	230	Little Double Bridges Cr	TSDB-11	941215	10:55	10	9.5	6.8	0.039	17	20	10	16	5.4		10.5	0.929	0.8	<MDL	0.09	0.01
0201	230	Little Double Bridges Cr	TSDB-11	950413	7:50	17	8.3	6.6	0.036	38	800	10	10	17.1		12	2.67	0.7	<0.01	0.14	0.02
0201	230	Little Double Bridges Cr	TSDB-12	940515	11:00	24	6.8	6.3	0.040	24		8	12	12.3		22	0.31	1.1	0.04	0.17	<MDL
0201	230	Little Double Bridges Cr	TSDB-12	940827	13:55	27	6.6	6.5	0.047	18	<2000	14	16	11.4		17	0.084	0.9	0.04	0.24	0.01
0201	230	Little Double Bridges Cr	TSDB-11	940827	15:27	29	6.6	6.6	0.055	19	<2000	12	16	6.0		15.3	0.088	0.9	0.03	0.26	0.01
0201	230	Little Double Bridges Cr	TSDB-12	941215	9:07	10	9.8	6.3	0.042	16	<20	10	12	5.4		11	1.02	1.0	0.01	0.09	0.01
0201	230	Little Double Bridges Cr	TSDB-12	950413	9:05	17	8.6	6.7	0.037	37	200	10	10	17.8		11.5	2.96	0.9	0.03	0.21	0.02
0201	240	Tight Eye Cr	TSDB-13	940515	11:45	24	5.9	6.2	0.033	12	130	9	10	41.5		12.5	0.183	3.5	0.02	0.15	0.01
0201	240	Tight Eye Cr	TSDB-13	941215	8:30	10	8.7	7.2	0.034	12	<20	8	10	3.6		9	0.692	0.6	<0.01	0.09	0
0201	240	Tight Eye Cr	TSDB-13	950413	8:21	17	8.8	6.4	0.028	22	230	6	7	7.0		9.75	2.23	0.6	<0.01	0.11	0.03
0201	240	Tight Eye Cr	TSDB-14	940515	12:25	25	6.1	6.6	0.046	13	<20	14	16	14.2		15	0.238	2.7	0.03	0.14	0.01
0201	240	Tight Eye Cr	TSDB-14	940827	12:42	28	7.0	6.8	0.046	17	<2000	14	18	3.9		13	0.039	0.6	0.04	0.21	0.01
0201	240	Tight Eye Cr	TSDB-14	941215	7:00	8	9.2	7.0	0.050	13	<20	16	18	3.4		12	0.913	0.6	<0.01	0.14	0.01
0201	240	Tight Eye Cr	TSDB-14	950404	15:05	16	7.9	7.1	0.043	14	40	12	18	3.2		10	1.34	0.6	<0.01	0.06	0.01
0201	240	Tight Eye Cr	TSDB-15	940515	16:15	25	7.2	6.6	0.049	14	70	14	18	5.8		15.5	0.196	2.3	0.01	0.21	<MDL
0201	240	Tight Eye Cr	TSDB-15	940827	10:15	25	7.0	6.5	0.049	14	<2000	16	18	3.1		19.5	0.038	0.5	0.03	0.14	0.01
0201	240	Tight Eye Cr	TSDB-15	940912	13:00	26	7.4	6.5	0.052	10		20	30								
0201	240	Tight Eye Cr	TSDB-15	941206	14:45	17	8.2	6.9	0.048	16	20	14	16	6.3		10.5	0.372	0.6	0.01	0.14	0.02
0201	240	Tight Eye Cr	TSDB-15	950404	12:20	16	9.4	7.0	0.049	13	40	14	17	8.1		10	0.452	0.6	<0.01	0.08	0.05
0201	250	Beaverdam Cr	TSDB-17	940515	15:00	26	6.8	6.8	0.054	12		18	18	5.1		14.5	0.162	4.7	0.01	0.24	0.01
0201	250	Beaverdam Cr	TSDB-17	940827	7:15	24	6.6	6.5	0.051	16	<2000	20	24	2.2		14.5	0.045	0.4	<MDL	0.16	0.01
0201	250	Beaverdam Cr	TSDB-17	940912	9:00	24	7.6	6.3	0.058	10		25	30								
0201	250	Beaverdam Cr	TSDB-17	941206	16:20	16	8.0	6.7	0.036	12	<20	8	20	6.0		11	0.215	0.4	<0.01	0.25	0.01
0201	250	Beaverdam Cr	TSDB-17	950404	13:30	16	8.4	7.0	0.042	7	130	12	18	3.6		10	0.356	0.3	<0.01	0.12	0.04

Appendix F-4c. Surface water quality data collected by Troy State Environmental Research & Services during 1994 to 1996 from selected stations in the Choctawhatchee River CU (Troy State University 1997)

CU	Sub-watershed	Stream Name	Station	Date	Time	T-H2O	Dissolved Oxygen	pH	Conductivity	Turbidity	Fecal Coliform	Total Alkalinity	Total Hardness	TSS	TDS	Chloride	NH3-N	NO2+NO3	NO2-N	T-PO4	Ortho-P
0201	250	Little Beaverdam Cr	TSDB-16	940515	18:00	28	6.8	6.3	0.049	10	40	14	18	10.9		17	0.129	2.5	<0.01	0.16	0.01
0201	250	Little Beaverdam Cr	TSDB-16	940827	6:10	24	3.9	6.4	0.052	14	<2000	18	20	5.9		14.5	0.031	0.3	0.01	0.12	0.01
0201	250	Little Beaverdam Cr	TSDB-16	940912	8:20	24	3.7	6.3	0.056	15		20	30								
0201	250	Little Beaverdam Cr	TSDB-16	941107	14:20	21	7.7	6.6	0.048			20	20								
0201	250	Little Beaverdam Cr	TSDB-16	941206	16:55	17	6.0	6.9	0.042	11	<20	10	11	4.2		10	0.286	0.4	<0.01	0.12	0.01
0201	250	Little Beaverdam Cr	TSDB-16	950404	14:00	20	7.0	6.5	0.041	12	40	10	13	6.5		10	0.372	0.5	<0.01	0.04	0.04
0201	250	Double Bridges Cr	TSDB-5	940515	16:48	25	7.1	6.6	0.075	18	<20	16	20	9.2		18.5	0.181	4.0	0.01	0.76	0.5
0201	250	Double Bridges Cr	TSDB-5	940827	11:02	27	6.9	6.6	0.077	18	<2000	20	24	9.6		19.5	0.038	2.5	0.05	0.58	0.35
0201	250	Double Bridges Cr	TSDB-6	940515	15:30	25	7.5	6.4	0.075	18	220	16	23	6.6		15.5	0.189	2.3	<0.01	0.57	0.38
0201	250	Double Bridges Cr	TSDB-6	940827	9:07	24	7.5	6.5	0.069	18	<2000	20	24	11.4		15.6	0.036	1.8	0.01	0.49	0.26
0201	250	Double Bridges Cr	TSDB-6	941206	13:47	17	8.3	6.8	0.055	27	40	16	20	16.3		11.5	0.337	1.2	0.03	0.44	0.08
0201	250	Double Bridges Cr	TSDB-6	950404	11:20	16	9.1	7.1	0.065	17	110	12	18	9.6		12	0.399	1.8	0.03	0.39	0.15
0201	250	Double Bridges Cr	TSDB-7	940827	8:00	24	7.5	6.4	0.068	18	<2000	20	22	9.4		17.5	0.034	1.7	0.01	0.41	0.18
0201	250	Double Bridges Cr	TSDB-7	940912	10:25	24	8.2	6.5	0.067	35		20	30								
0201	250	Double Bridges Cr	TSDB-7	941206	12:45	17	8.6	6.7	0.052	25	<20	16	16	16.7		11.5	0.308	1.3	0.03	0.29	0.04
0201	250	Double Bridges Cr	TSDB-7	950404	10:45	15	9.4	7.3	0.064	16	80	13	18	8.8		11.75	0.313	1.7	0.03	0.35	0.05

Appendix F-5 §303(d) Waterbody Monitoring Project

***Lead agency*:** ADEM

***Purpose*:** In accordance with Section 303(d) of the Federal Clean Water Act, each state must identify its polluted water bodies that do not meet surface water quality standards and submit this list to the USEPA. In an effort to address water quality problems within Alabama, some water bodies were included on ADEM's §303(d) list that were only suspected of having water quality problems based on evaluated assessment data. ADEM conducts monitored assessments of priority water bodies to support §303(d) listing and de-listing decisions. This project includes intensive chemical, habitat, and biological data collected using ADEM's SOPs and QA/QC manuals.

Appendix F-5c. Physical/ chemical data

References: ADEM. 2000c. Water quality monitoring data collected by ADEM in support of CWA §303(d) listing and de-listing decisions 1999-2000 (unpublished). Field Operations Division. Alabama Department of Environmental Management. Montgomery, AL.

Appendix F-5c. Physical/chemical data collected at § 303(d) monitoring stations located within the Choctawhatchee River basin. (ADEM 1999c)

Sub-Watershed	Station	Date	Time	Air Temp.	Water Temp.	pH	Conductivity	Dissolved Oxygen	Turbidity	Fecal Coliform	BOD-5	TSS	TOC	T-PO4	NO3+ NO2	NH3-N	TKN
	#	*yymmdd*	*24hr*	*C*	*C*	*s.u.*	*umhos@25c*	*mg/l*	*NTU*	*col/100ml*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
Upper Choctawhatchee (0314-0201)																	
130	BRH 001	990512	0730	21	20	6.9	40	6.2	9.75	140	0.40	1	4.29	0.03	0.20	0.01	0.38
130	BRH 001	990608	0915	29	26	6.74	40	4.6	12.2	234	4.00	10	4.94	0.02	0.19		0.52
130	BRH 001	990721	1130	34	27		55	5.7	7.48	80	1.20	1	6.79	0.02	0.19	0.01	0.59
130	BRH 001	990804	1155	36	32	6.46	70	5.0	11.1	103	0.50	4	5.22	0.00	0.20	0.02	0.15
130	BVC 001	990511	1500	30	24.5	7.19	150	6.8	9.28	170	8.60	19	21.11	0.91	0.17	0.30	4.57
130	BVC 001	990608	1150	32	26	7.28	170	6.6	8.59	170	1.50	10	3.36	0.46	2.56		0.15
130	BVC 001	990721	1200	32	29	7.10	140	7.1	7.20	1030	1.10	9	3.80	0.19	1.03	0.05	0.40
130	BVC 001	990804	1243	36	30	6.83	160	6.1	9.86	170	0.80	8	3.30	0.34	1.57	0.01	0.15
130	BVC 002	990506	0915	26	21.73	6.07	182	6.14	7.16								
130	BVC 002	990511	1030	22.5	22	7.62	195	7.8	15.4	560	1.50	4	3.22	0.38	1.68	0.01	0.41
130	BVC 002	990608	1125	32	27	7.2	230	6.6	10.5	180	1.30	12	3.07	0.78	3.74		0.38
130	BVC 002	990721	1115	33	28	7.09	175	6.1	8.66	600	1.80	8	3.78	0.42	1.76	0.01	0.74
130	BVC 002	990804	1140	36	31	6.77	240	6.1	9.79	430	1.00	9	3.57	0.68	2.65	0.01	0.15
130	BVC 003	990511	1325	29	25	7.0	80	7.0	10.4	80	1.00	1	3.66	0.02	0.09	0.01	0.44
130	BVC 003	990608	1035	32	26	7.0	75	5.6	10.9	29	1.50	6	2.68	0.02	0.08		0.24
130	BVC 003	990721	1030	32	37	6.92	80	5.2	7.08	113	0.50	2	3.37	0.02	0.15	0.01	0.50
130	BVC 003	990804	1105	36	30	6.47	100	4.6	19.4	100	1.80	27	3.31	0.01	0.06	0.01	0.15
130	BVWW001	990511	1000	28.5	23.5	7.75	600	8.7	6.83	39	3.20	6	6.87	1.60	6.40	0.02	2.01
130	BVWW001	990608	1020	32	27	7.94	510	7.9	5.48	137	3.70	18	7.00	2.97	14.23		1.62
130	BVWW001	990721	1045	32	28	6.81	390	0.0	12.3	600	32.00	31	10.20	1.79	3.82	0.43	3.57
130	BVWW001	990804	1115	36	30	7.52	650	7.9	3.43	340	2.60	9	5.25	2.83	9.29	0.02	0.15
170	HCWW001	990520	1050	35	26.4	8.82	410	8.1	15.5	13	7.00	6	11.87	1.62	2.35	0.09	5.13
170	HCWW001	990609	1215	35	30	7.96	460	3.1	7.78	8	14.00	13	11.09	1.77	1.47		0.15
170	HCWW001	990722	1020	34	29	7.04	400	5.1	1.89	38	3.50	2	8.45	1.71	2.57	0.90	4.76
170	HCWW001	990805	1145	33	30	6.97	410	6.1	2.17	117	1.90	3	7.99	2.08	0.94	0.03	1.04
170	HDC 001	990512	1420	24	20	6.51	160	4.34	27.6	2000	4.60	46	28.93	0.52	0.03	0.01	4.83
170	HDC 001	990609	1010	32	25	7.64	70	7.5	9.93	74	0.70	9	4.16	0.10	0.02		0.72
170	HDC 001	990722	0945	30	28	7.4	100	7.9	15.5	410	1.30	7	3.76	0.01	0.33	0.01	0.57
170	HDC 001	990805	1010	40	28	7.49	120	7.2	17.8	350	1.20	12	4.59	0.08	0.47	0.01	0.15
170	HDC 002	990520	1020	29	21.7	6.51	60	7.7	18.0	170	0.50	8	4.73	0.01	0.25	0.11	0.50
170	HDC 002	990601	1000	27	25	6.44	65.7	6.2	12.8								
170	HDC 002	990609	1120	41	27	7.18	55	6.4	10.9	40	2.20	11	3.24	0.01	0.34		0.49
170	HDC 002	990722	1015	31	27	6.86	55	5.9	12.4	250	1.60	11	4.06	0.08	0.77	0.01	0.66
170	HDC 002	990805	1110	35	28	6.94	70	6.2	8.83	190	0.40	3	3.74	0.00	0.25	0.01	0.15
170	UTHC001	990520	1125	30	22.8	7.47	130	7.7	9.01	600	1.20	8	4.14	0.07	0.33	0.30	0.56
170	UTHC001	990601	1045	30	25	6.98	146.6	6.4	5.53								
170	UTHC001	990609	1050	35	27	7.5	140	7.0	6.46	240	2.20	8	3.83	0.05	0.59		1.12
170	UTHC001	990722	1000	31	27	7.40	140	6.4	23.5	600	1.50	15	3.27	0.03	0.59	0.01	0.42
170	UTHC001	990805	1045	40	28	7.31	150	7.0	9.62	600	1.50	4	4.09	0.00	0.46	0.04	0.15

Appendix F-5c. Physical/chemical data collected at § 303(d) monitoring stations located within the Choctawhatchee River basin. (ADEM 1999c)

Sub-Watershed	Station	Date	Time	Air Temp.	Water Temp.	pH	Conductivity	Dissolved Oxygen	Turbidity	Fecal Coliform	BOD-5	TSS	TOC	T-PO4	NO3+ NO2	NH3-N	TKN
	#	*yymmdd*	*24hr*	*C*	*C*	*s.u.*	*umhos@25c*	*mg/l*	*NTU*	*col/100ml*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
Pea River (0314-0202)																	
100	PATC001	990617	1230	32	26	7.09	50	7.0	21.9	67	1.10	13	5.04	0.02	0.18		0.15
100	PATC001	990707	1230		26.2	6.96	40	7.0	10.1	470	0.50	20	6.41	0.04	0.16	0.01	0.60
100	PATC001	990825	1225	32	28	7.36	55	7.5	13.9	350	0.50	14	4.06	0.00	0.21	0.01	0.15
100	PATC001	990922	1215	25	22	6.81	48	8.0			1.70	10	3.19	0.06	0.24	0.01	0.23
080	UTBC001	990617	1115	33	26	7.79	120	7.5	29.6	890	3.10	28	5.54	0.03	0.15		0.15
080	UTBC001	990707	1015		25	6.99	110	7.4	6.3	180	0.50	9	5.12	0.04	0.22	0.01	0.27
080	UTBC001	990825	1030	30	26	7.58	220	8.0	4.57	150	0.50	4	2.73	0.00	0.31	0.01	0.15
080	UTBC001	990922	1100	24	21	7.8	200	8.0			1.80	10	2.28	0.07	0.36	0.01	0.15
080	UTBC002	990602	0710	23	22	6.53	56.8	7.3	19.9								
080	UTBC002	990617	1025	32	27	7.28	50	7.2	24.5	540	1.10	28	6.46	0.02	0.11		0.15
080	UTBC002	990707	0925		25.5	7.22	50	1.4	10.0	350	0.70	19	7.38	0.07	0.06	0.01	0.57
080	UTBC002	990825	0950	30	25	6.85	40	7.1	27.4	600	2.40	14	8.08	0.00	0.06	0.55	0.80
080	UTBC002	990922	1012														
080	UTBC003	990617	0925	25	24	6.85	40	5.8	57.7	2480	2.10	45	10.51	0.03	0.07		0.23
080	UTBC003	990707	0905	27	25	7.32	75	7.8	6.1	215	0.60	11	6.52	0.04	0.08	0.01	0.80
080	UTBC003	990922	1000														
080	UTBC004	990617	0900	25	25	7.62	120	6.6	22.1	270	1.00	25	4.76	0.03	0.12		0.15
080	UTBC004	990707	0845	25	25	7.69	120	6.4	8.0	93	0.30	10	5.35	0.02	0.09	0.21	0.57
080	UTBC004	990825	0930	27	25	7.57	170	6.7	7.93	113	1.00	11	3.59	0.00	0.16	0.27	0.28
080	UTBC004	990922	0930	20	20	6.9	120	7.5			1.30	10	3.04	0.05	0.17	0.01	0.25

Appendix F-6 Southeast Alabama Poultry Industry Impact Study

Lead agency: Cooperative effort by ADEM and Rivers and Reservoirs Laboratory. Department of Fisheries. Auburn, AL.

Purpose: The objectives of this project were to collect a baseline of surface water quality data from selected watersheds expected to receive point and/or non-point sources of pollution associated with the increased poultry production in Southeast Alabama. The increase of poultry production activity is associated with the opening of the Charoen Pokphand plant near Eufaula, Alabama. In the spring of 1998 Chareon Pokphand provided ADEM with a map of broiler farms. The information was reviewed and eight monitoring locations were selected. The eight streams were sampled from August 1998 through September 1999. Data collected included water chemistry, stream flow, habitat assessments and aquatic macroinvertebrate and fish community surveys.

Tables: 6a, 6c and 7c. Assessment data

Appendix: F-6a. Chemical data

References: ADEM. 1999g. FY99 Southeast Alabama Poultry Industry Impact Study. Unpublished data. Alabama Department of Environmental Management.

Appendix F-6c. Physical / Chemical data collected as part of the Southeast Alabama Poultry Industry Impact Study, 1998 and 1999.

Sub-watershed number	Station	Date	Water Temp	D.O.	Flow (cfs)	Fecal col/100 ml	TSS mg/L	TDS mg/L	BOD5 mg/L	TOC mg/L	Alk mg/L	Hard mg/L	NO3+NO2 mg/L	PO4-P mg/L	NH3-N 0.015DL mg/L	TKN 0.15DL mg/L	TON 0.2DL mg/L	As 0.010DL mg/L	Cu 0.020DL mg/L	Mg mg/L	Zn 0.03DL mg/L
Upper Choctawhatchee (0314-0201)																					
010	EFCB-1	980804	24	6.1	Too High	41	7	86	0.6	3.24	55	44.4	0.04	0.01	<MDL	0.87	0.87	<MDL	<MDL	1.02	<MDL
	EFCB-1	981014	19	7.1	Too High	103	8	62	0.6	4.52	43	24.5	0.08	0.004	<MDL	0.2	0.2	<MDL	<MDL	0.883	<MDL
	EFCB-1	990128	14	8.2	Too High	87	2	52	0.2	3.31	126	22.8	0.14	0.004	<MDL	0.3	0.3	<MDL	<MDL	0.727	<MDL
	EFCB-1	990419	18	8.3	Too High	30	2	58	0.5	4.16	29	27	0.003	0.01	<MDL	0.45	0.45	<MDL	<MDL	0.898	<MDL
	EFCB-1	990517	20	7.4	Too High	87	2	42	0.6	4.08	43	27.4	0.09	0.004	<MDL	<MDL	<MDL	<MDL	0.0311	0.926	0.076
	EFCB-1	990614	25	6	Too High	33	7	74	0.6	3.96	31	29	0.04	0.01	<MDL	<MDL	<MDL	<MDL	<MDL	0.852	<MDL
	EFCB-1	990719	33	6	Too High	350	4	96	3.1	3.06	52	41.2	0.1	0.04	<MDL	<MDL	<MDL	<MDL	<MDL	0.978	<MDL
	EFCB-1	990816	26	6.1	Too High	34	3	68	0.6	4.14	40	44.5	0.08	0.004	<MDL	0.15		<MDL	<MDL	1.1	<MDL
	EFCB-1	990920	22	6.3	Too High	25	10	93	0.3	3.35	62	57	0.06	0.06	<MDL	<MDL	<MDL	<MDL	<MDL	0.979	<MDL
020	EFCD-2	980804	25	7.5	104	60	11	94	0.4	4.36	30	30.6	0.39	0.02	<MDL	0.56	0.56	<MDL	<MDL	1.56	<MDL
	EFCD-2	981014	20	8.6	Too High	177	7	69	0.1	5.71	39	25.1	0.32	0.004	<MDL	0.44	0.44	<MDL	<MDL	1.38	<MDL
	EFCD-2	990128	15	9.1	Too High	260	14	54	0.4	5.43	66	18.2	0.22	0.03	0.07	0.22	0.22	<MDL	<MDL	0.945	<MDL
	EFCD-2	990420	17	9.5	159	80	2	46	0.2	3.7	36	31.3	0.01	0.1	<MDL	0.59	0.59	<MDL	<MDL	1.35	<MDL
	EFCD-2	990517	21	8.3	Too High	97	7	63	0.6	5.74	28	27.1	0.25	0.01	<MDL	0.53	0.53	<MDL	<MDL	1.28	0.09
	EFCD-2	990614	25	7.3	Too High	180	50	84	0.3	4.61	25	32.4	0.19	0.02	<MDL	<MDL	<MDL	<MDL	<MDL	1.33	<MDL
	EFCD-2	990719	34	7	Too High	90	11	76	0.9	5.97	24	23.5	0.24	0.04	<MDL	0.14	0.14	<MDL	<MDL	1.39	<MDL
	EFCD-2	990816	28	7.7	102	73	3	53	0.5	4.48	23	31.6	0.24	0.004	<MDL	0.3		<MDL	<MDL	1.42	<MDL
	EFCD-2	990920	24	7.7	50	84	6	76	0.9	2.69	55	37.5	0.48	0.06	<MDL	<MDL	<MDL	<MDL	<MDL	1.76	<MDL
100	JDYD-1	980804	25	7.6	33	133	9	76	0.7	7.97	10	16	0.05	0.03	<MDL	0.67	0.67	<MDL	<MDL	1.37	<MDL
	JDYD-1	981014			44	157	7	61	0.5	7.53	12	15.6	0.07	0.004	<MDL	<MDL	<MDL	<MDL	<MDL	1.4	<MDL
	JDYD-1	990128	19	9.1	104	203	9	46	0.6	4.89	45	10.2	0.08	0.02	<MDL	<MDL	<MDL	<MDL	<MDL	0.928	<MDL
	JDYD-1	990420	14	9.1	17	47	6	60	0.3	6.15	20	19.3	0.003	0.02	<MDL	0.68	0.68	<MDL	<MDL	1.5	<MDL
	JDYD-1	990517	17	9.1	25	97	4	52	0.6	6.26	22	19.5	0.11	0.004	<MDL	0.56	0.56	<MDL	<MDL	1.58	<MDL
	JDYD-1	990614	21	8.8	20	40	7	69	0.3	5.92	21	20.9	0.08	0.02	<MDL	<MDL	<MDL	<MDL	<MDL	1.34	<MDL
	JDYD-1	990719	27	7.1	28	60	3	91	0.9	7.05	27	20.8	0.14	0.03	<MDL	<MDL	<MDL	<MDL	<MDL	1.7	<MDL
	JDYD-1	990816	33	7.2	5	167	3	65	0.5	5.67	24	24.6	0.1	0.004	<MDL	0.34		<MDL	<MDL	1.77	<MDL
	JDYD-1	990921	28	7	5	220	11	64	0.9	5.92	24	23.5	0.04	0.06	<MDL	0.49	0.49	<MDL	<MDL	1.79	<MDL
Pea River (0314-0202)																					
040	CLWC-1	980804	25	8	14	80	9	81	0.8	4.6	11	17	0.7	0.02	<MDL	1.46	1.46	<MDL	<MDL	1.78	<MDL
	CLWC-1	981015	19	8.2	20	180	7	55	1.4	4.12	11	16.3	0.72	0.004	<MDL	0.24	0.24	<MDL	<MDL	1.73	<MDL
	CLWC-1	990127	13	10.2	17	340	10	54	0.9	3.56	355	14.2	0.72	0.03	<MDL	0.21	0.21	<MDL	<MDL	1.51	<MDL
	CLWC-1	990419	15	9.9	9	200	274	70	1.3	4.53	23	15.1	0.13	0.19	<MDL	0.2	0.2	<MDL	<MDL	1.49	<MDL
	CLWC-1	990518	21	8.8	11	107	2	55	1.7	5.73	24	17.1	0.36	0.04	<MDL	0.6	0.6	<MDL	<MDL	1.74	<MDL
	CLWC-1	990615	26	7.5	15	107	10	69	1.7	5.61	20	16.2	0.35	0.02	<MDL	<MDL	<MDL	<MDL	<MDL	1.65	<MDL
	CLWC-1	990720	33	7.3	15	70	5	73	1.2	6.44	23	15.3	0.38	0.04	<MDL	0.74	0.74	<MDL	<MDL	1.56	<MDL
	CLWC-1	990817	28	7.4	19	840	5	50	1.4	4.97	20	17.4	0.3	0.005	<MDL	0.28		<MDL	<MDL	1.85	<MDL
	CLWC-1	990921	23	7.7	11	5	7	54	1.6	4.8	35	18.2	0.22	0.07	<MDL	0.47	0.47	<MDL	<MDL	2.01	<MDL
030	PEAB-1	980804	27	7.1	To High	10	10	100	0.6	5.27	12	13.7	0.06	0.04	<MDL	1.34	1.34	<MDL	<MDL	1.07	<MDL
	PEAB-1	981014	19	7.6	To High	32	6	77	0.3	10.75	20	15.9	0.04	0.004	<MDL	0.72	0.72	<MDL	<MDL	1.1	<MDL

Appendix F-6c. Physical / Chemical data collected as part of the Southeast Alabama Poultry Industry Impact Study, 1998 and 1999.

Sub-watershed number	Station	Date	Water Temp	D.O.	Flow (cfs)	Fecal col/100 ml	TSS mg/L	TDS mg/L	BOD5 mg/L	TOC mg/L	Alk mg/L	Hard mg/L	NO3+NO2 mg/L	PO4-P mg/L	NH3-N 0.015DL mg/L	TKN 0.15DL mg/L	TON 0.2DL mg/L	As 0.010DL mg/L	Cu 0.020DL mg/L	Mg mg/L	Zn 0.03DL mg/L
	PEAB-1	990127	13	8.2	To High	400	11	80	0.8	10.32	93	10.2	0.003	0.04	<MDL	0.41	0.41	<MDL	<MDL	0.719	<MDL
	PEAB-1	990419	15	7.3	To High	117	12	74	2.1	11.49	17	11.7	0.003	0.17	<MDL	0.8	0.8	<MDL	<MDL	0.704	<MDL
	PEAB-1	990517	20	7.6	To High	37	9	65	0.5	7.88	32	18.4	0.17	0.04	<MDL	0.37	0.37	<MDL	<MDL	1.17	0.079
	PEAB-1	990614	26	7	To High	37	8	72	0.7	6.33	20	14.1	0.15	0.04	<MDL	0.23	0.23	<MDL	<MDL	0.965	<MDL
	PEAB-1	990719	32	6	To High	93	12	106	2.9	10	20	15.5	0.15	0.13	<MDL	0.21	0.21	<MDL	<MDL	1.06	<MDL
	PEAB-1	990816	27	6.1	To High	53	5	61	0.5	5.92	13	17.4	0.15	0.01	<MDL	0.38		<MDL	<MDL	1.12	<MDL
	PEAB-1	990920	23	6.8	10.9	52	4	62	0.9	3.74	39	18.4	0.12	0.06	<MDL	<MDL	<MDL	<MDL	<MDL	1.23	<MDL
070	WWCC-2	980820	26	6.8	38	77	13	102	1.1	4.57	41	44.6	0.71	0.04	<MDL	0.33	0.33	<MDL	<MDL	1.62	<MDL
	WWCC-2	981015	19	7.7	137	63	9	94	1	4.64	34	39.7	0.71	0.004	0.1	0.39	0.29	<MDL	<MDL	1.64	<MDL
	WWCC-2	990127	12	9.6	212	360	11	76	0.6	4.01	174	29	0.32	0.05	0.12	1.01	0.89	<MDL	<MDL	1.48	<MDL
	WWCC-2	990419	14	9.3	124	83	5	98	0.1	3.69	41	46.1	0.05	0.13	<MDL	0.51	0.51	<MDL	<MDL	2.03	<MDL
	WWCC-2	990518	21	8.1	85	52	3	102	0.4	3.28	60	49.3	0.63	0.03	<MDL	<MDL	<MDL	<MDL	<MDL	2.33	<MDL
	WWCC-2	990615	24	7.3	47	52	9	155	0.2	4.59	30	58.2	0.83	0.06	<MDL	<MDL	<MDL	<MDL	<MDL	4.68	<MDL
	WWCC-2	990720	31	6.9	113	180	10	110	1.5	5.37	41	37.2	0.25	0.06	<MDL	0.23	0.23	<MDL	<MDL	1.95	<MDL
	WWCC-2	990817	26	6.8	33	63	8	184	0.3	3.94	77	69.3	0.88	0.03	<MDL	0.56		<MDL	<MDL	5.3	<MDL
	WWCC-2	990921	21	7.1	26	133	6	187	1.2	3.27	125	93.2	0.85	0.1	<MDL	0.2	0.2	<MDL	<MDL	5.16	<MDL
070	WWCP-1	980820	26	6.4	34	57	12	76	0.9	4.63	43	38.3	1.33	0.004	<MDL	1.53	1.53	<MDL	<MDL	1.61	<MDL
	WWCP-1	981015	18	7.1	94	94	8	98	0.9	4.29	31	37.1	0.85	0.004	<MDL	0.23	0.23	<MDL	<MDL	1.68	<MDL
	WWCP-1	990127	12	9.5	130	160	7	84	0.2	3.35	123	30.3	0.42	0.06	<MDL	<MDL	<MDL	<MDL	<MDL	1.92	<MDL
	WWCP-1	990419	14	8.6	87	197	79	106	1.6	6	35	33.3	0.06	0.23	<MDL	1.01	1.01	<MDL	<MDL	2.03	<MDL
	WWCP-1	990518	20	8.1	68	63	10	97	0.4	3.63	50	46.1	0.86	0.06	<MDL	0.14	0.14	<MDL	<MDL	2.82	<MDL
	WWCP-1	990615	25	6.5	36	63	8	163	0.2	3.51	92	64.4	0.83	0.02	<MDL	<MDL	<MDL	<MDL	<MDL	3.58	<MDL
	WWCP-1	990720	33	6.5	63	160	6	111	2.9	6.95	46	36.6	0.32	0.11	<MDL	0.69	0.69	<MDL	<MDL	2.22	<MDL
	WWCP-1	990817	26	6.6	26	123	5	135	0.3	3.75	77	65.6	0.51	0.004	<MDL	<MDL		<MDL	<MDL	3.25	<MDL
	WWCP-1	990921	23	7.1	32	340	15	223	1.7	4.15	94	83.7	0.68	0.11	<MDL	0.35	0.35	<MDL	<MDL	8.39	<MDL

Appendix F-8 ALAMAP (Alabama Monitoring and Assessment Program)

***Lead agencies*:** ADEM and USEPA

***Purpose*:** Statewide monitoring effort under development to provide data that can be used to estimate the current status of all streams within Alabama. Evaluated assessment data, including chemical, physical, and habitat parameters are collected once at 250 stations, randomly selected by USEPA-Gulf Breeze over a 5-year period using *ADEM's SOPs and QA/QC manuals* (ADEM 1997a).

Appendix F-8c. Physical/ chemical data

Appendix F-9c. Habitat assessment data

References: ADEM. 2000b. Alabama Monitoring and Assessment Program (ALAMAP) data collected by ADEM 1997 to 2000 (unpublished). Field Operations Division. Alabama Department of Environmental Management. Montgomery, AL.

Appendix F-8c. Physical/chemical data collected during August 1997-1999 as part of the Alabama Monitoring and Assessment Program (ALAMAP) from locations within the Choctawhatchee River CU (ADEM 1997c, 1998)

Sub-Watershed	Stream Name	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Depth	Fecal Coliform	BOD-5	TDS	TSS	NO2/ NO3	T-PO4	Cl-
#		#	*yymmdd*	*24hr*	*C*	*C*	*mg/l*	*s.u.*	*umhos @25c*	*NTU*	*cfs*	*m*	*col/100ml*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
Upper Choctawhatchee (0314-0201)																			
020	East Fork of Choctawhatchee R.	CW04U2-7	980805	0745	23	25	7	7.2	108	11.2	45.5	0.4	43J	0.4	76	8	0.13	0.02	4.7
070	West Fork of Choctawhatchee R.	CW03U3-10	990805	1415	35	29	8	7.0	109	5.12	52.6	---	>60	0.8	65	3	0.24	<0.004	5.76
080	Judy Creek	CW02U2-26	980804	1419	28	25	6	7.0	55	13.7	5.7	0.2	69L	0.8	73	9	0.15	0.01	7.07
080	Judy Creek	CW03U2-34	980804	1640	27	25	7	7.1	41	21.4	17.1	0.1	239	0.9	74	10	0.08	0.02	5.72
130	Sandy Branch	CW02U1	970807	0944	30	22	7	6.0	47	12.5	2.7	0.2	600L	0.2	73	18	0.614	0.11	5.4
Pea (0314-0202)																			
010	Double Creek	CW01U2-23	980804	1000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
050	Whitewater Creek, UT to	CW01U1	970806	1541	30	24	5	5.5	57	27.1	0.10J	0.1	120	0.5	75	12	1.2	0.15	6.7
050	Whitewater Creek	CW02U3-26	990805	1050	39	27	5	5.9	108	10.4	0.1J	---	80	0.7	68	8	0.11	<0.004	8
060	Walnut Creek, UT to	CW01U3-52	990805	0945	33	32	7	6.1	49	3.21	0.8	---	est. 2	1.3	101	7	0.14	<0.004	5.71

1. Stream bed dry; No flow or habitat assessment conducted; no samples collected.

Appendix F-9c. Physical characteristics and habitat quality of sites assessed in the Upper Choctawhatchee River (0201) and Pea River (0202) cataloging units as part of the Alabama Montoring and Assessment Program (ALAMAP).

Cataloging Unit	0201	0201	0201	0201	0201	0201	0202	0202
Station	CW02U1	CW04U2-7	CW03U3-10	CW02U2-26	CW03U2-34	CW4U4-38	CW01U1	CW01U3-52
Subwatershed #	130	020	070	080	080	090	050	060
Ecoregion/ Subregion	65g	65d	65d	65d	65d	65d	65d	65d
Date (YYMMDD)	970807	980805	990805	980804	980804	000808	970806	990805
Width (ft)	15	45	40	15	20	20	4	6
Canopy Cover*	MS	50/50	MS	S	MS	S	S	MO
Depth (ft) Riffle			0.8					
Run	0.5	1.0	1.5	1.5	0.5	1.5	0.3	0.5
Pool	2.0	2.0		2.5	2.5	3.0	0.5	1.0
Substrate (%) Bedrock			20					
Boulder								
Cobble								
Gravel	3							
Sand			11			75		
Silt	50	85	60	82	85	5	63	85
Detritus	37	2	2	3	2		15	5
Clay	5	10	12	10	10	20	20	9
Org. Silt	5	3	6	5	3		2	1
Geomorphology	GP	GP	RR	GP	GP	GP	GP	GP
Habitat Survey (% maximum)								
Instream Habitat Quality	45	40	48	48	47	59	27	33
Sediment Deposition	55	68	78	75	65	89	80	88
Sinuosity	45	80	95	65	85	75	55	50
Bank and Vegetative Stability	55	33	73	50	33	90	65	80
Riparian Measurements	38	90	90	90	90	95	90	90
Habitat Assessment Score	104	128	169	144	134	177	130	149
% Maximum	47	58	70	65	61	80	59	68
Assessment	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

Appendix F-10 Clean Water Strategy Project
Lead Agency: ADEM

Purpose: Intensive water quality monitoring was conducted to evaluate the condition of the state's surface waters, identify or confirm problem areas, and to serve as a guide from which to direct future sampling efforts. Sampling stations were chosen where problems were known or suspected to exist, or where there was a lack of existing data. Data was collected monthly, June through October, 1996. All samples and in-situ measures were collected in accordance with ADEM Standard Operating Procedures and Quality Assurance/Quality Control manuals.

Appendix F-10c. Physical/ chemical data

References: ADEM. 1999a. Alabama Clean Water Strategy Water Quality Assessment Report (1996). Alabama Department of Environmental Management. Montgomery, AL

Appendix F-10c. Water quality data collected from stations located within the Choctawhatchee River basin during ADEM's 1996 Clean Water Strategy Project.

Sub-watershed #	Stream Name	Station #	Date *yymmdd*	Time *24hr*	Stream Depth *ft*	Sampling Depth *ft*	Water Temp. *C*	Dissolved Oxygen *mg/l*	pH *s.u.*	Conductivity *umhos @25c*	Turbidity *NTU*	Stream Flow *cfs*	Fecal Coliform *col/100ml*	BOD-5 *mg/l*	TSS *mg/l*	NO2+ NO3 *mg/L*	NH3-N *mg/l*	TKN *mg/l*	T-PO4 *mg/l*
Upper Choctawhatchee (0314-0201)																			
100	Cripple Cr	CHO10	960618	0900	2.0	1.0	24	7.0	7.1	73	9			1		0.43	0.015	0.15	0.06
100	Cripple Cr	CHO10	960716	1115	1.0	0.0	26	6.9	7.1	93	8					0.39	<0.015	<0.15	0.085
100	Cripple Cr	CHO10	960813	1025	0.5	0.0	25	6.7	6.8	110	5								
100	Cripple Cr	CHO10	960918	1210	1.5	0.7	25	7.5	7.4	142	5			0.5		0.57	<0.015	0.39	0.02
100	Cripple Cr	CHO10	961022	1250	2.0	1.0	17	8.4	7.6	167	4			0.5		0.39	<0.015	<0.15	0.085
100	Cripple Cr	CHO11	960618	1000	3.0	1.5	25	7.6	7.5	80	9			0.8		0.68	0.015	0.15	0.06
100	Cripple Cr	CHO11	960716	1145	1.0	0.0	26	7.4	7.5	99	12								
100	Cripple Cr	CHO11	960813	1050	1.0	0.5	26	7.4	6.8	119									
100	Cripple Cr	CHO11	960918	1155	0.6	0.3	25	7.7	7.6	153	5			1.2		0.72	<0.015	0.39	0.02
100	Cripple Cr	CHO11	961022	1230	1.0	0.5	16	8.9	7.8	166	4			0.8		0.78	<0.015	<0.15	0.02
110	Choctawhatchee R	CHO08	960618	1640			28	7.1	7.2	68	9			0.5		0.63	0.015	0.15	0.08
110	Choctawhatchee R	CHO08	960717	0920	4.0	2.0	27	6.8	7.2	76	18								
110	Choctawhatchee R	CHO08	960814	0950	4.0	2.0	25	7.0	6.8	72	18								
110	Choctawhatchee R	CHO08	960918	0939	9.0	4.5	24	6.8	7.2	86	15			0.7		0.38	<0.015	0.4	0.07
110	Choctawhatchee R	CHO08	961022	0950	6.0	3.0	15	8.9	7.2	97	7	79		0.6		0.68	<0.015	<0.15	0.085
130	Little Choctawhatchee R	CHO16	960618	1745	6.5	3.0	25	6.8	6.9	102	9			0.5		1.37	0.015	0.15	0.2
130	Little Choctawhatchee R	CHO16	960717	1020	5.0	2.5	26	6.4	7.3	126	9								
130	Little Choctawhatchee R	CHO16	960814	1050	3.0	1.5	25	6.4	6.7	125	8								
130	Little Choctawhatchee R	CHO16	960918	0850	7.0	3.5	22	5.8	7.0	112	12			0.8		0.44	<0.015	0.21	0.11
130	Little Choctawhatchee R	CHO16	961022	0900	1.5	0.8	15	7.9	7.4	137	18			0.7		1.28	<0.015	0.34	0.134
130	Little Choctawhatchee R	CHO17	960618	1725	5.0	2.5	26	7.5	7.0	88	9			0.4		1.14	0.015	0.15	0.13
130	Little Choctawhatchee R	CHO17	960717	0950	3.0	1.5	26	7.7	7.4	126	8								
130	Little Choctawhatchee R	CHO17	960814	1025	2.0	1.0	25	7.2	6.8	105	12								
130	Little Choctawhatchee R	CHO17	960918	0915	2.5	1.3	22	6.9	7.1	101	16			1.3		0.46	<0.015	0.71	0.09
130	Little Choctawhatchee R	CHO17	961022	0920	2.0	1.0	14	8.9	7.2	119	7			0.7		1.07	0.015	0.15	0.093
160	Claybank Cr	CHO01	960618	1545	3.0	1.5	27	7.1	6.0	49	14			0.6		0.59	0.015	3.36	0.12
160	Claybank Cr	CHO01	960716	0815	2.0	1.0	25	7.1	6.8	68	14								
160	Claybank Cr	CHO01	960814	0840	1.0	0.5	24	7.1	6.7	71	22	22							
160	Claybank Cr	CHO01	960918	1025	1.5	0.7	22	7.4	7.1	94	14			0.9		0.78	<0.015	0.23	0.09

Sub-watershed #	Stream Name	Station #	Date *yymmdd*	Time *24hr*	Stream Depth *ft*	Sampling Depth *ft*	Water Temp. *C*	Dissolved Oxygen *mg/l*	pH *s.u.*	Conductivity *umhos @25c*	Turbidity *NTU*	Stream Flow *cfs*	Fecal Coliform *col/100ml*	BOD-5 *mg/l*	TSS *mg/l*	NO2+ NO3 *mg/L*	NH3-N *mg/l*	TKN *mg/l*	T-PO4 *mg/l*
Upper Choctawhatchee (0314-0201)																			
160	Claybank Cr	CHO01	961022	1040	2.0	1.0	14	9.3	7.2	100	9			1.2		0.94	<0.015	0.22	0.082
160	Claybank Cr	CHO02	960618	1615	6.0	3.0	27	7.0	6.9	57	12			1.3		0.67	0.015	1.3	0.11
160	Claybank Cr	CHO02	960717	0850	2.0	1.0	26	6.9	7.0	77	14								
160	Claybank Cr	CHO02	960814	0915	2.0	1.0	24	6.9	6.3	73	30								
160	Claybank Cr	CHO02	960918	1000	1.5	0.7	22	7.2	7.1	91	13			1		0.7	0.015	0.49	0.06
160	Claybank Cr	CHO02	961022	1015	3.5	1.8	14	9.0	7.2	101	9			0.8		0.92	<0.015	<0.15	0.081
210	Choctawhatchee R	CHO09	960618	1330	8.0	4.0	29	6.8	7.1	57	12			0.3		0.59	0.015	0.15	0.1
210	Choctawhatchee R	CHO09	960716	1605	6.0	3.0	29	6.9	7.0	77	20								
210	Choctawhatchee R	CHO09	960813	1510	8.0	4.0	28	6.6	6.8	71	21								
210	Choctawhatchee R	CHO09	960918	1505	10.0	5.0	27	6.8	7.0	82	16			0.9		0.44	<0.015	0.34	0.05
210	Choctawhatchee R	CHO09	961022	1630	6.0	3.0	16	8.7	7.2	93	8			0.7		0.71	<0.015	0.23	0.071
230	Blanket Cr	CHO03	960618	1430	0.5		27	6.2	7.1	138	10			0.9		1.47	0.065	1.19	0.28
230	Blanket Cr	CHO03	960716	1650	1.0	0.0	28	5.7	6.9	146	12								
230	Blanket Cr	CHO03	960813	1555	1.0	0.5	26	6.1	6.8	166	6								
230	Blanket Cr	CHO03	960918	1050	1.0	0.6	21	6.3	7.1	176	9			1.2		0.47	0.015	0.75	0.17
230	Blanket Cr	CHO03	961022	1115	1.0	0.5	15	7.8	7.2	189	9			1.1		1.1	<0.015	<0.15	0.199
230	Double Bridges Cr	CHO04	960618	1500	6.0	3.0	26	6.5	6.9	80	26			1.2		2.78	0.015	0.18	0.45
230	Double Bridges Cr	CHO04	960716	1715	3.0	1.5	27	6.3	6.4	67	32								
230	Double Bridges Cr	CHO04	960813	1620	1.0	0.5	27	6.5	6.7	97	17								
230	Double Bridges Cr	CHO04	960918	1110	3.0	1.5	25	6.8	7.0	103	17			1.5		1.98	<0.015	0.61	0.33
230	Double Bridges Cr	CHO04	961022	1135	1.5	0.8	15	8.8	7.1	112	14			0.9		2.3	<0.015	0.43	0.297
250	Double Bridges Cr	CHO05	960618	1120	6.0	3.0	26	6.2	7.1	60	18			0.4		1.24	0.015	0.15	0.18
250	Double Bridges Cr	CHO05	960716	1405	4.0	2.0	27	6.7	7.3	70	38								
250	Double Bridges Cr	CHO05	960813	1220	2.0	1.0	27	7.3	6.8	85	13								
250	Double Bridges Cr	CHO05	960918	1352	4.0	2.0	26	7.3	7.2	84	12			1.1		0.9	<0.015	0.33	0.14
250	Double Bridges Cr	CHO05	961022	1420	3.5	1.8	16	9.3	7.4	98	9			0.9		1.64	<0.015	<0.15	0.188

Sub-watershed #	Stream Name	Station #	Date *yymmdd*	Time *24hr*	Stream Depth *ft*	Sampling Depth *ft*	Water Temp. *C*	Dissolved Oxygen *mg/l*	pH *s.u.*	Conductivity *umhos @25c*	Turbidity *NTU*	Stream Flow *cfs*	Fecal Coliform *col/100ml*	BOD-5 *mg/l*	TSS *mg/l*	NO2+ NO3 *mg/l*	NH3-N *mg/l*	TKN *mg/l*	T-PO4 *mg/l*
Pea (0314-0202)																			
020	Pea R	CHO06	960618	1920	6.0	3.0	25	5.4	6.3	48	18			0.8		0.16	0.015	0.15	0.06
020	Pea R	CHO06	960717	1225	4.0	2.0	26	6.2	6.8	47	18								
020	Pea R	CHO06	960814	1220	3.0	1.5	25	5.8	6.5	48	13								
020	Pea R	CHO06	960918	0735	5.9	2.9	22	5.7	6.7	58	18			0.9		0.03	<0.015	0.5	0.04
020	Pea R	CHO06	961017	1120	6.0	3.0	19	7.5	6.7	61	11			0.9		0.09	0.015L	0.3	0.03
100	Pea R	CHO07	960618	0940	6.0	3.0	27	6.7	7.0	65	14			0.4		0.46	0.015	0.15	0.26
100	Pea R	CHO07	960716	1210	4.0	2.0	28	6.9	7.2	77	20								
100	Pea R	CHO07	960813	1315			28	6.8	6.5	78	21								
100	Pea R	CHO07	960918	1140	2.0	1.0	27	7.1	7.0	75	15			0.8		0.22	<0.015	0.49	0.02
100	Pea R	CHO07	961022	1210	2.0	1.0	16	8.9	7.4	109	7			0.6		0.34	<0.015	3.23	0.052
140	Sandy Cr	CHO14	960618	1040	4.0	2.0	26	2.5	6.5	77	5			1		0.023	0.015	0.15	0.09
140	Sandy Cr	CHO14	960716	1310	2.0	1.0	26	4.5	6.3	79	6								
140	Sandy Cr	CHO14	960813	1300	1.0	0.5	27	1.8	6.5	115	4								
140	Sandy Cr	CHO14	960918	1240	2.0	1.0	26	2.6	6.5	118	5			1.6		0.03	<0.015	0.76	0.09
140	Sandy Cr	CHO14	961022	1330	2.5	1.3	16	3.9	7.0	133	4			1.7		0.01	<0.015	<0.15	0.08
140	Sandy Cr	CHO15	960618	1100	2.0	1.0	24	7.4	6.7	49	5			0.9		0.44	0.015	0.15	0.07
140	Sandy Cr	CHO15	960716	1340	2.0	1.0	27	6.4	6.7	58									
140	Sandy Cr	CHO15	960813	1330	1.0	0.5	26	7.2	6.7	63	4								
140	Sandy Cr	CHO15	960918	1300	1.5	0.7	27	7.4	7.1	65	5			0.8		0.38	<0.015	0.27	0.02
140	Sandy Cr	CHO15	961022	1400	1.5	0.8	17	8.7	7.1	67	2			0.6		0.62	0.015	0.29	0.044
Lower Choctawhatchee (0314-0203)																			
010	Spring Cr	CHO12	960618	1300	5.0	205.0	27	3.3	6.4	47	5			0.6		0.59	0.022	0.15	0.08
010	Spring Cr	CHO12	960716	1515	5.0	2.5	27	4.7	6.5	66	7								
010	Spring Cr	CHO12	960813	1435			26	4.1	6.4	69	4								
010	Spring Cr	CHO12	960918	1440	3.5	1.5	26	4.3	6.5	64	5			0.9		0.43	<0.015	0.39	0.02
010	Spring Cr	CHO12	961022	1545	3.5	1.8	17	6.1	6.6	68	2			0.9		0.57	<0.015	<0.15	0.072
010	Spring Cr	CHO13	960618	1235	2.0	1.0	26	6.9	6.8	38	10			0.6		0.95	0.015	0.15	0.07
010	Spring Cr	CHO13	960716	1450	3.0	1.5	27	6.9	7.0	47	18								
010	Spring Cr	CHO13	960813	1415	1.0	0.5	26	6.9	6.4	54	8								
010	Spring Cr	CHO13	960918	1422	2.0	1.0	27	7.1	7.0	52	11			0.9		0.74	<0.015	0.15	0.01
010	Spring Cr	CHO13	961022	1530	2.0	1.0	17	8.6	7.0	56	7			0.6		1.16	<0.015	0.15	0.076